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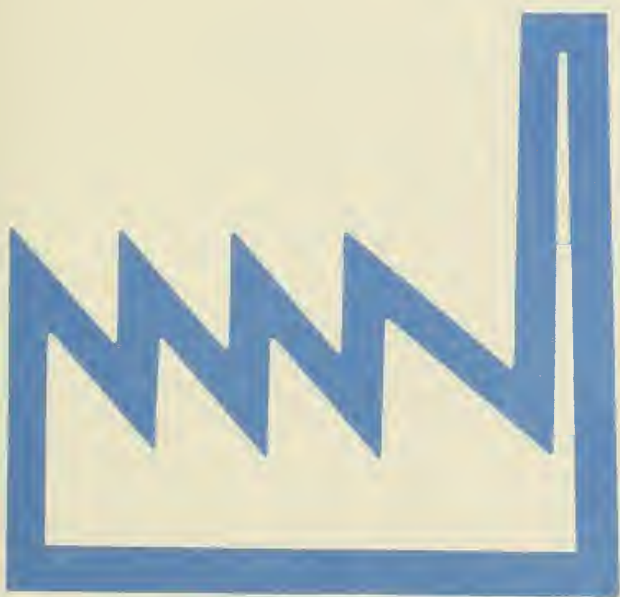
Census of Manufactures

MC87-I-36A

INDUSTRY SERIES

Electrical Transmission and Distribution Equipment and Electrical Industrial Apparatus

Industries 3612, 3613, 3621, 3624, 3625, and 3629



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If you have any questions concerning the statistics in this report, call (301) 763-7304.

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INTRODUCTION

PURPOSE AND USES OF THE ECONOMIC CENSUSES

The economic censuses are the major source of facts about the structure and functioning of the Nation's economy. They provide essential information for government, business, industry, and the general public.

Economic censuses furnish an important part of the framework for such composite measures as the gross national product, input-output measures, production and price indexes, and other statistical series that measure short-term changes in economic conditions.

Policy-making agencies of the Federal Government use the data, especially in monitoring economic activity and providing assistance to business.

State and local governments use the data to assess business activities and tax bases within their jurisdictions and to develop programs to attract business.

Trade associations study trends in their own and competing industries, and keep their members informed of market changes.

Individual businesses use the data to locate potential markets and to analyze their own production and sales performance relative to industry or area averages.

AUTHORITY AND SCOPE

Title 13 of the United States Code (sections 131, 191, and 224) directs the Census Bureau to take the economic censuses every 5 years, covering years ending in 2 and 7. The 1987 Economic Censuses consist of the

- Census of Retail Trade
- Census of Wholesale Trade
- Census of Service Industries
- Census of Transportation
- Census of Manufactures
- Census of Mineral Industries
- Census of Construction Industries

Special programs also cover enterprise statistics and minority-owned and women-owned businesses. (The 1987 Census of Agriculture and 1987 Census of Governments are conducted separately.) The next economic censuses are scheduled to be taken in 1993 covering the year 1992.

AVAILABILITY OF THE DATA

The results of each of the economic censuses are available in printed reports, for sale by the U.S. Government Printing Office, and on microfiche, computer tape, compact discs with read-only memory, and flexible diskettes, for sale by the Census Bureau. Order forms for all types of products are available on request from Customer Services, Census Bureau, Washington, DC 20233. A more complete description of publications being issued from this census is on the inside back cover of this document.

Census facts are also widely disseminated by trade associations, business journals, and newspapers. Volumes containing census statistics are available in most major public and college libraries. Finally, State Data Centers in every State and Business and Industry Data Centers in many States also supply economic census statistics.

WHAT'S NEW IN 1987

Several changes have taken place for the 1987 censuses. Data will be reported on the basis of the newly revised Standard Industrial Classification (SIC) system with selected reports including "bridge tables," linking the old and new classification systems. A new set of metropolitan areas has been adopted, and more detailed information will be available for businesses with no paid employees. For additional information on these changes, review the subsequent text.

HISTORICAL INFORMATION

The economic censuses have been taken together as an integrated program at 5-year intervals since 1967, and before that for 1963, 1958, and 1954. Prior to that time, the individual censuses were taken separately at varying intervals.

The economic censuses trace their beginnings to the 1810 Decennial Census, when questions on manufacturing were included with those for population. Coverage of economic activities was expanded for 1840 and subsequent censuses to include mining and some commercial

activities. In 1902, Congress established a permanent Census Bureau and directed that a census of manufactures be taken every 5 years. The 1905 manufactures census was the first time a census was taken apart from the regular every-10-year population census.

The first census of business was taken in 1930, covering 1929. Initially it covered retail and wholesale trade, and construction industries, but it was broadened in 1933 to include some of the service trades.

The 1954 economic censuses were the first to be fully integrated—providing comparable census data across economic sectors, using consistent time periods, concepts, definitions, classifications, and reporting units. These were the first censuses to be taken by mail, using lists of firms provided by the administrative records of other federal agencies. Since 1963, administrative records have also been used to provide basic statistics as well for very small firms, reducing or eliminating the need to send them census questionnaires. The Enterprise Statistics Program, which publishes combined data from the economic censuses, was made possible with the implementation of the integrated census program in 1954.

The range of industries covered in the economic censuses has continued to expand. The Census of Construction Industries began on a regular basis in 1967, and the scope of service industries was broadened in 1967, 1977, and 1987. The Census of Transportation began in 1963 as a set of surveys covering travel, transportation of commodities, and trucks. New for 1987 are publications reporting on business establishments engaged in several transportation industries, paralleling the data on establishments in other sectors. This is part of a gradual expansion in coverage of industries previously subjected to government regulation. The Survey of Minority-Owned Business Enterprises was first conducted as a special project in 1969 and was incorporated into the economic censuses in 1972 along with the Survey of Women-Owned Businesses.

Economic censuses have also been taken in Puerto Rico since 1909, in the Virgin Islands and Guam since 1958, and in the Northern Mariana Islands since 1982.

Statistical reports from the 1982 and earlier censuses provide historical figures for the study of long-term time series, and are available in some large libraries. All of the census data published since 1967 are still available for sale on microfiche from the Census Bureau.

AVAILABILITY OF MORE FREQUENT ECONOMIC DATA

While the censuses provide complete enumerations every 5 years, there are many needs for more frequent data as well. The Census Bureau conducts a number of monthly, quarterly, and annual surveys, the results of which appear in publication series such as *Current Business Reports* (retail and wholesale trade and service industries), the *Annual Survey of Manufactures*, *Current Industrial Reports*, and the *Quarterly Financial Report*. Most of these surveys, while providing more frequent

observations, yield less kind-of-business and geographic detail than the censuses. The *County Business Patterns* program offers annual statistics on the number of establishments, employment, and payroll classified by industry within each county.

SOURCES FOR MORE INFORMATION

More information about the scope, coverage, classification system, data items, and publications for each of the economic censuses and related surveys is published in the *Guide to the 1987 Economic Censuses and Related Statistics*. More information on the methodology, procedures, and history of the censuses will be published in the *History of the 1987 Economic Censuses*. Contact Customer Services for information on availability.

CENSUS OF MANUFACTURES

General

This report, from the 1987 Census of Manufactures, is one of a series of 83 industry reports, each of which provides statistics for individual industries or groups of related industries. Additional separate reports will be issued for each State and the District of Columbia and for special subjects such as type of organization, distribution of sales by class of customer, concentration ratios and water use in manufacturing.

The industry reports include such statistics as number of establishments, employment, payroll, value added by manufacture, cost of materials consumed, capital expenditures, product shipments, etc.

State reports present similar statistics for each State and its important metropolitan statistical areas (MSA's), counties, and places. Selected statistical totals for "all manufacturing" have been shown in the State reports for MSA's with 250 employees or more and for counties and places with 450 employees or more.

The *General Summary* report will contain industry, product class, and geographic area statistics summarized in one report. The introduction to the *General Summary* discusses, at greater length, many of the subjects described in this introduction. For example, the *General Summary* text will discuss the relationship of value added by manufacture to National income by industry of origin, the changes in statistical concepts over the history of the censuses, and the valuation problems arising from intracompany transfers between manufacturing plants of a company and between manufacturing plants and sales offices and sales branches of a company.

Scope of Census and Definition of Manufacturing

The 1987 Census of Manufactures covers all establishments with one paid employee or more primarily engaged in manufacturing as defined in the *1987 Standard Industrial*

*Classification (SIC) Manual*¹. This is the system of industrial classification developed by experts on classification in Government and private industry under the guidance of the Office of Information and Regulatory Affairs, Office of Management and Budget. This classification system is used by Government agencies as well as many organizations outside the Government.

The SIC Manual defines manufacturing as the mechanical or chemical transformation of substances or materials into new products. The assembly of component parts of products also is considered to be manufacturing if the resulting product is neither a structure nor other fixed improvement. These activities are usually carried on in plants, factories, or mills that characteristically use power-driven machines and materials-handling equipment.

Manufacturing production is usually carried on for the wholesale market, for transfers to other plants of the same company, or to the order of industrial users rather than for direct sale to the household consumer. Some manufacturers in a few industries sell chiefly at retail to household consumers through the mail, through house-to-house routes, or through salespersons. Some activities of a service nature (enameling, engraving, etc.) are included in manufacturing when they are performed primarily for trade. They are considered nonmanufacturing when they are performed primarily to the order of the household consumer.

Relationship Between Annual Survey of Manufactures and Census of Manufactures

The Bureau of the Census conducts the annual survey of manufactures (ASM) in each of the 4 years between the censuses of manufactures. The ASM is a probability-based sample of approximately 56,000 establishments and collects the same industry statistics (employment, payroll, value of shipments, etc.) as the census of manufactures. In addition to collecting the information normally requested on the census form, the establishments in the ASM sample are requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, costs of purchased services, and foreign content of materials consumed. Except for supplemental labor costs, the extra ASM items are collected only in census years.

Establishment Basis of Reporting

The census of manufactures is conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each location. The ASM also is conducted on an establishment basis, but separate reports are filed for just those establishments selected in the sample. Companies engaged in

distinctly different lines of activity at one location are requested to submit separate reports if the plant records permit such a separation and if the activities are substantial in size.

In 1987, as in earlier years, a minimum size limit was set for inclusion of establishments in the census. All establishments employing one person or more at any time during the census year are included. The same size limitation has applied since 1947 in censuses and annual surveys of manufactures. In the 1939 and earlier censuses, establishments with less than \$5,000 value of products were excluded. The change in the minimum size limit in 1947 does not appreciably affect the historical comparability of the census figures except for data on number of establishments for a few industries. This report excludes information for separately operated administrative offices, warehouses, garages, and other auxiliary units that service manufacturing establishments of the same company (see Auxiliaries).

Manufacturing Universe and Census Report Forms

The 1987 Census of Manufactures universe includes approximately 350,000 establishments. The amounts of information requested from manufacturing establishments were dependent upon a number of factors. The more important considerations were the size of the company and whether it was included in the annual survey of manufactures. The methods of obtaining information for the various subsets of the universe to arrive at the aggregate figures shown in the publication are described below:

1. Small Single-Establishment Companies Not Sent a Report Form

In the 1987 Census of Manufactures, approximately 150,000 small single-establishment companies were excused from filing reports. Selection of these small establishments was done on an industry-by-industry basis and was based on annual payroll and total shipments data as well as on the industry classification codes contained in the administrative records of Federal agencies. The cutoffs were selected so that these administrative-records cases would account for no more than 3 percent of the value of shipments for all manufacturing. Generally, all single-establishment companies with less than five employees were excused, while all establishments with more than 20 employees were mailed forms.

Information on the physical location of the establishment, as well as information on payrolls, receipts (shipments), and industry classification, was obtained from the administrative records of other Federal agencies under special arrangements, which safeguarded their confidentiality. Estimates of data for these small establishments were developed using industry averages in conjunction with the administrative information. The value of shipments and cost of materials

¹Standard Industrial Classification Manual: 1987: For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, Stock No. 041-001-00314-2.

were not distributed among specific products and materials for these establishments but were included in the product and material "not specified by kind" (n.s.k.) categories.

The industry classification codes included in the administrative-records files were assigned on the basis of brief descriptions of the general activity of the establishment. As a result, an indeterminate number of establishments were erroneously coded at the four-digit SIC level. This was especially true whenever there was a relatively fine line of demarcation between industries or between manufacturing and nonmanufacturing activity.

Sometimes these administrative-record cases were only given a two- or three-digit SIC group. For the 1987 Census of Manufactures, these establishments were sent a separate classification form, which requested information on the products and services of the establishment. This form was used to code many of these establishments to the four-digit SIC level. Establishments that did not return the classification form were coded later to those four-digit SIC industries identified as "not elsewhere classified" (n.e.c.) within the given two- or three-digit industry groups.

As a result of these situations, a number of small establishments may have been misclassified by industry. However, such possible misclassification has no significant effect on the statistics other than on the number of companies and establishments.

The total establishment count for individual industries should be viewed as an approximation rather than a precise measurement. The counts for establishments with 20 employees or more are far more reliable than the count of total number of establishments.

2. Establishments Sent a Report Form

The 200,000 establishments covered in the mail canvass were divided into three groups:

- a. **ASM sample establishments**—This group consisted of approximately 56,000 establishments covering all the units of large manufacturing establishments as well as a sample of the medium and smaller establishments. The probability of selection was proportionate to size (see appendix, Annual Survey of Manufactures).

In a census of manufactures year, the ASM report form (MA-1000) replaces the first page of the regular census form for those establishments included in the ASM. In addition to information on employment, payroll, and other items normally requested on the regular census form, establishments in the ASM sample were requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, and costs of purchased services. See appendix A, section 2, for an explanation of these items.

The census part of the report form is one of approximately 200 versions containing product, material, and special inquiries. The diversity of manufacturing activities necessitated the use of these many forms to canvass the 459 manufacturing industries. Each form was developed for a group of related industries.

Appearing on each form was a list of products primary to the group of related industries as well as secondary products and miscellaneous services that establishments classified in these industries were likely to be performing. Respondents were requested to identify the products, the value of each product, and, in a large number of cases, the quantity of the product shipped during the survey year. Space also was provided for the respondent to describe products not specifically identified on the form.

The report form also contained a materials-consumed inquiry, which varied from form to form depending on the industries being canvassed. The respondents were asked to review a list of materials generally used in their production processes. From this list, each establishment was requested to identify those materials consumed during the survey year, the cost of each, and, in certain cases, the quantity consumed. Once again, space was provided for the respondent to describe significant material not identified on the form.

Finally, a wide variety of special inquiries was included to measure activities peculiar to a given industry, such as operations performed and equipment used.

- b. **Large and medium establishments (non-ASM)**—Approximately 84,000 establishments were included in this group. A variable cutoff, based on administrative-records payroll data and determined on an industry-by-industry basis, was used to select those establishments that were to receive one of the approximately 200 census of manufactures regular forms. The first page, requesting establishment data for items such as employment and payroll, was standard but did not contain the detailed statistics included on the ASM form. The product, material, and special inquiry sections supplied were based on the historical industry classification of the establishment.
- c. **Small single-establishment companies (non-ASM)**—This group consisted of approximately 60,000 establishments. For those industries where application of the variable cutoff for administrative-records cases resulted in a large number of small establishments being included in the mail canvass, an abbreviated or "short" form was used. These establishments received one of the approximately 80 versions of the short form, which requested

summary product and material data and totals but no details on employment, payrolls, cost of materials, inventories, and capital expenditures.

Use of the short form has no adverse effect on published totals for the industry statistics; the same data were collected on the short form as on the long form. However, detailed information on materials consumed was not collected on the short form; thus its use would increase the value of the n.s.k. categories.

Auxiliaries

In this industry report, the data on employment and payroll are limited to operating manufacturing establishments. The census report form filed for auxiliaries (ES-9200) requested a description of the activity of the establishments serviced. However, the manufacturing auxiliaries were coded only to the two-digit major group of the establishments they served; whereas, the operating establishments were coded to a four-digit manufacturing industry. Data for the approximately 10,000 separately operated auxiliaries are included in the geographic area series and in a report issued as part of the 1987 Enterprise Statistics Survey.

Auxiliaries are establishments whose employees are primarily engaged in performing supporting services for other establishments of the same company, rather than for the general public or for other business firms. They can be at different locations from the establishments served or at the same location as one of those establishments but not operating as an integral part thereof and serving two establishments or more. Where auxiliary operations are conducted at the same location as the manufacturing operation and operate as an integral part thereof, they usually are included in the report for the operating manufacturing establishment.

Included in the broad category of auxiliaries are administrative offices. Employees in administrative offices are concerned with the general management of multiestablishment companies, i.e., with the general supervision and control of two units or more, such as manufacturing plants, mines, sales branches, or stores. The functions of these employees may include (1) program planning, including sales research and coordination of purchasing, production, and distribution; (2) company purchasing, including general contracts and purchasing methods; (3) company financial policy and accounting; (4) general engineering, including design of product machinery and equipment, and direction of engineering effort conducted at the individual operation locations; (5) direction of company personnel matters; and (6) legal and patent matters.

Other types of auxiliaries serving the plants or central management of the company include purchasing offices, sales promotion offices, research and development organizations, etc.

Industry Classification of Establishments

Each of the establishments covered in the census was classified in 1 of 459 manufacturing industries in accordance with the industry definitions in the 1987 SIC Manual. The 1987 edition of this manual represents a major revision for manufacturing industries from the 1972 edition and its 1977 supplement. Appendix A of the 1987 Manual notes the revisions in the four-digit industry levels between 1972/77 and 1987.

An industry is generally defined as a group of establishments producing the same product or a closely related group of products. The product groupings from which industry classifications are derived are based on considerations such as similarity of manufacturing processes, types of materials used, types of customers, and the like. The resulting group of establishments must be significant in terms of number, value added by manufacture, value of shipments, and number of employees. The system operates in such a way that the definitions progressively become narrower with successive additions of numerical digits. For 1987, there are 20 major groups (two-digit SIC), 139 industry groups (three-digit SIC), and 459 industries (four-digit SIC). This represents an expansion of four-digit industries from 452 in 1972/77 and a reduction of three-digit groups from 143 in 1972/77. Product classes and products of the manufacturing industries have been assigned codes based on the industry from which they originate. There are about 11,000 products identified by a seven-digit code. The seven-digit products are considered the primary products of the industry with the same four digits.

Accordingly, an establishment is usually classified in a particular industry on the basis of its major activity during a particular year, i.e., production of the products primary to that industry exceeds, in value, production of the products primary to any other single industry. In a few instances, however, the industry classification of an establishment is not only determined by the products it makes but also by the process employed in operations. Refining of nonferrous metals from ore or rolling and drawing of nonferrous metals (processes which involve heavy capitalization in specialized equipment) would be classified according to the process used during a census year. These establishments then would be "frozen" in that industry during the following ASM years.

In either a census or ASM year, establishments included in the ASM sample with certainty weight, other than those involved with heavily capitalized activities described above, are reclassified by industry only if the change in the primary activity from the prior year is significant or the change has occurred for 2 successive years. This procedure prevents reclassification when there are minor shifts in product mix.

In ASM years, establishments included in the ASM sample with noncertainty weight are not shifted from one industry classification to another. They are retained in the industry where they were classified in the base census year (see appendix, Annual Survey of Manufactures).

However, in the following census year, these ASM plants are allowed to shift from one industry to another.

The result of these rules covering the switching of plants from one industry classification to another is that, at the aggregate level, some industries comprise different mixes of establishments between survey years, and establishment data for such industry statistics as employment and payroll may be tabulated in different industries between survey years. Hence, comparisons between prior-year and current-year published totals, particularly at the four-digit SIC level, should be viewed with caution. This is particularly true for the comparison between the data shown for a census year versus the data shown for the previous ASM year.

As previously noted, the small establishments that may have been misclassified by industry are usually administrative-record cases whose industry codes were assigned on the basis of incomplete descriptions of the general activity of the establishment. Such possible misclassifications have no significant effect on the statistics other than on the number of companies and establishments.

While some establishments produce only the primary products of the industry in which they are classified, all establishments of an industry rarely specialize to this extent. The industry statistics (employment, inventories, value added by manufacture, total value of shipments including resales and miscellaneous receipts, etc.) shown in tables 1a through 5a, therefore, reflect not only the primary activities of the establishments in that industry but also their secondary activities. The product statistics in table 6a represent the output of all establishments whether or not they are classified in the same industry as the product. For this reason, in relating the industry statistics, especially the value of shipments to the product statistics, the composition of the industry's output shown in table 5b should be considered.

The extent to which industry and product statistics may be matched with each other is measured by two ratios which are computed from the figures shown in table 5b. The first of these ratios, called the primary product specialization ratio, measures the proportion of product shipments (both primary and secondary) of the establishments classified in the industry represented by the primary products of those establishments. The second ratio, called the coverage ratio, is the proportion of primary products shipped by the establishments classified in the industry to total shipments of such products by all manufacturing establishments.

However, establishments making products falling into the same industry category may use a variety of processes and materials to produce them. Also, the same industry classification (based on end products) may include both establishments that are highly integrated and those that put only the finishing touches on an already highly fabricated item. For example, the refrigeration equipment industry includes instances of almost complete integration (production of the compressor, condensing unit, electric motor, casting, stamping of the case, and final assembly) all

carried on at one plant. On the other hand, the condensing unit, the motor, and the case may be purchased and only assembled into the finished product.

In some instances, separate industry categories have been established for integrated and nonintegrated establishments. For other industries, the census provides separate statistics on the production of intermediate commodities made and used in the producing plant. For some industries characterized by many plants of the same company, separate figures on interplant transfers of products usually are shown.

Differences in the integration of production processes, types of operations, and alternatives in types of materials used should be considered when relating the industry statistics (employment, payrolls, value added, etc.) to the product and material data.

Value of Shipments for the Industry Compared With Value of Product Shipments

This report shows value of shipments data for industries and products. In tables 1a through 5a, these data represent the total value of shipments of all establishments classified in a particular industry. The data include the shipments of the products classified in the industry (primary to the industry), products classified in other industries (secondary to the industry), and miscellaneous receipts (repair work, sale of scrap, research and development, installation receipts, and resales). Value of product shipments shown in table 6a represents the total value of all products shipped that are classified as primary to an industry.

CENSUS DISCLOSURE RULES

In accordance with Federal law governing census reports, no data are published that would disclose the data for an individual establishment or company. However, the number of establishments classified in a specific industry is not considered a disclosure, so this information may be released even though other information is withheld.

The disclosure analysis for the industry statistics in tables 1a through 5a of this report is based on the total value of shipments. When the total value of shipments cannot be shown without disclosing information for individual companies, the complete line is suppressed. However, the suppressed data are included in higher-level totals. Additional disclosure analysis is performed for new capital expenditures that can be suppressed even though value of shipments data are publishable.

SPECIAL TABULATIONS

Special tabulations of data collected in the 1987 Census of Manufactures may be obtained on computer tape or in tabular form. The data will be in summary form and subject to the same rules prohibiting disclosure of confidential

information (including name, address, kind of business, or other data for individual business establishments or companies) as are the regular publications.

Special tabulations are prepared on a cost basis. A request for a cost estimate, as well as exact specifications on the type and format of the data to be provided, should be directed to the Chief, Industry Division, Bureau of the Census, Washington, DC 20233.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in this publication:

- Represents zero.
- (D) Withheld to avoid disclosing data for individual companies; data are included in higher level totals.
- (NA) Not available.
- (NC) Not comparable.
- (S) Withheld because estimate did not meet publication standards.
- (X) Not applicable.
- (Z) Less than half the unit shown.
- do Ditto.

- n.e.c. Not elsewhere classified.
- n.s.k. Not specified by kind.
- pt. Part.
- r Revised.
- SIC Standard Industrial Classification.

Other abbreviations, such as lb, gal, yd, doz, bbl, and s tons, are used in the customary sense.

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Census/ASM		
Durables	Kenneth Hansen	(301) 763-7304
Nondurables	Michael Zampogna	(301) 763-2510
Current Industrial Reports		
Durables	Malcolm Bernhardt	(301) 763-2518
Nondurables	Thomas Flood	(301) 763-5911
Import/Export Publications	Foreign Trade Division	(301) 763-5140
Industry Analysis and Forecasts	International Trade Administration	(202) 377-4356

Users' Guide for Locating Statistics in This Report by Table Number

For explanation of terms, see appendixes

Item	Four-digit industry statistics							Five-digit product class and seven-digit product statistics			
	Historical	Operating ratios	By geographic area	Summary and supplemental	By employment size	By industry and product class specialization	Materials consumed by kind	Industry-product analysis	Product shipments	Product class by geographic area	Historical product class
Number of companies	1a			3a					*6a		
Number of establishments...	1a		2	3a	4	5a					
Employment and payroll:.....											
Number of employees	1a	1b	2	3a	4	5a					
Payroll	1a	1b	2	3a	4	5a					
Supplemental labor costs ...				3a							
Production workers	1a	1b	2	3a	4	5a					
Production- worker hours...	1a	1b	2	3a	4	5a					
Production- worker wages...	1a	1b	2	3a	4	5a					
Shipments, cost of materials, and value added:											
Value of shipments (four-digit)	1a	1b	2	3a	4	5a		5b			
Product class shipments (five-digits)									6a	6b	6c
Product shipments (seven-digit)									6a		
Value added by manufacture	1a	1b	2	3a	4	5a					
Cost of materials	1a	1b	2	3a	4	5a					
Fuels and electric energy ...				3a							
Materials consumed by kind .							7				
Inventories:											
Total, end of year	1a			3a	4						
By stage of fabrication				3a							
Capital expenditures, assets, rental payments, and purchased services:											
New capital expenditures...	1a		2	3b	4	5a					
Used plant and equipment expenditures				3b							
Gross assets				3b							
Depreciation				3b							
Retirements of buildings and machinery				3b							
Rental payments				3b							
Foreign content of materials consumed				3c							
Purchased services.....				3c							
Ratios:											
Specialization	1a			3a				5b			
Coverage	1a			3a				5b			

*Number of companies with shipments of more than \$100 thousand.

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DESCRIPTION OF INDUSTRIES AND SUMMARY OF FINDINGS

This report shows 1987 Census of Manufactures statistics for establishments classified in each of the following industries:

SIC code and title

3612	Transformers, Except Electronic
3613	Switchgear and Switchboard Apparatus
3621	Motors and Generators
3624	Carbon and Graphite Products
3625	Relays and Industrial Controls
3629	Electrical Industrial Apparatus, N.E.C.

The industry statistics (employment, payroll, cost of materials, value of shipments, inventories, etc.) are reported for each establishment as a whole. Aggregates of such data for an industry reflect not only the primary activities of the establishments but also their activities in the manufacture of secondary products as well as their miscellaneous activities (contract work on materials owned by others, repair work, etc.). This fact should be taken into account when comparing industry statistics (tables 1 through 5a) with product statistics (table 6) showing shipments by all industries of the primary products of the specified industry. The extent of the "product mix" is indicated in table 5b, which shows the value of primary and secondary products shipped by establishments classified in the specified industry and the value of primary products of the industry shipped as secondary products by establishments classified in other industries.

Small single-establishment companies with up to 20 employees (cutoff varied by industry) were excluded from the mail portion of the census. For these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated), data on payrolls and receipts were obtained from administrative records of other Federal agencies. The remaining statistics were developed from industry averages.

Establishment data were tabulated based on industry definitions included in the 1987 Standard Industrial Classification (SIC) Manual¹. The 1987 edition represents a major revision for manufacturing industries from the 1972 edition and its 1977 supplement. In addition to the 1987 SIC revision, changes were made to the product class (five-digit) and product code (seven-digit) categories. The

product class and product code comparability between the 1987 and 1982 censuses is shown in the appendixes. These appendixes present, in tabular form, the linkage from 1987 to 1982.

All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

INDUSTRY 3612, TRANSFORMERS, EXCEPT ELECTRONIC

This industry is made up of establishments primarily engaged in manufacturing power, distribution, instrument, and specialty transformers. Establishments primarily engaged in manufacturing radio frequency or voice frequency electronic transformers, coils, or chokes are classified in industry 3677, and those manufacturing resistance welder transformers are classified in industry 3548.

Products of this industry also are collected in the Current Industrial Report MQ36C, Fluorescent Lamp Ballasts.

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1987 Census of Manufactures, Industry 3612, Transformers, Except Electronic, had employment of 32.2 thousand. The employment figure was 17 percent below the 39.0 thousand reported in 1982. Compared with 1986, employment decreased 6 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses. The leading States in employment in 1987 were Wisconsin, Mississippi, Illinois, and North Carolina. This represents a shift from 1982 when Wisconsin, Pennsylvania, Massachusetts, and Illinois were the leading States.

The total value of shipments for establishments classified in this industry was \$3.3 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3612 shipped \$3.1 billion of transformers, except electronic, products considered primary to the industry, \$150.4 million of secondary products, and had \$74.1 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary

¹Standard Industrial Classification Manual: 1987. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock No. 041-001-00314-2.

and primary products shipped by establishments in the industry was 95 percent (specialization ratio). In 1982, the specialization ratio was 94 percent.

Establishments in this industry also accounted for 98 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio was 96 percent. The products primary to industry 3612, no matter in what industry they were produced, appear in table 6a and aggregate to \$3.1 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the transformers, except electronic, industry amounted to \$1.7 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 6 percent of total value of shipments.

INDUSTRY 3613, SWITCHGEAR AND SWITCHBOARD APPARATUS

This industry is made up of establishments primarily engaged in manufacturing switchgear and switchboard apparatus. Important products of this industry include power switches, circuit breakers, power switching equipment, and similar switchgear for general industrial application; switchboards and cubicles, control and metering panels, fuses and fuse mountings, and similar switchboard apparatus and supplies. Establishments primarily engaged in manufacturing relays are classified in industry 3625. Establishments manufacturing switches other than switchgear type are classified in industry 3625 if the switches are of the type used as industrial controls, in industry 3679 if the switches are of the type used in electronic devices, and in industry 3643 if the switches are of other types used in wiring circuits. Products of this industry also are collected in the Current Industrial Report MA36A, Switchgear, Switchboard Apparatus, Relays, and Industrial Controls.

The 1987 definition of this industry has been revised from that used in the 1972 Standard Industrial Classification (SIC) manual. However, the SIC number and title are unchanged. 1972 SIC-based industry 3613 was split into two separate industries: Switchgear and Switchboard Apparatus (SIC 3613) and Relays and Industrial Controls (SIC 3625). The effect of the revisions on the data is summarized in tables 1c-1 and 1c-2. During the 1987 processing, each establishment was classified according to both the old and new SIC. Table 1c-1 shows the distribution of the new industry among the old SIC classifications. Table 1c-2 shows the distribution of the old SIC-based industries among the new SIC classifications.

In the 1987 Census of Manufactures, Industry 3613, Switchgear and Switchboard Apparatus, had employment of 44.4 thousand. The leading States in employment were Illinois, California, Pennsylvania, and Ohio.

The total value of shipments for establishments classified in this industry was \$4.9 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3613 shipped \$4.3 billion of switchgear and switchboard apparatus products considered primary to the industry, \$360.9 million of secondary products, and had \$275.0 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 92 percent (specialization ratio).

Establishments in this industry also accounted for 93 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). The products primary to industry 3613, no matter in what industry they were produced, appear in table 6a and aggregate to \$4.6 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the switchgear and switchboard apparatus industry amounted to \$2.0 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 6 percent of total value of shipments.

INDUSTRY 3621, MOTORS AND GENERATORS

This industry is made up of establishments primarily engaged in manufacturing electric motors (except engine starting motors) and power generators; motor generator sets; railway motors and control equipment; and motors, generators, and control equipment for gasoline, electric, and oil-electric buses and trucks. Establishments primarily engaged in manufacturing turbogenerators are classified in industry 3511; those manufacturing starting motors and battery charging generators for internal combustion engines are classified in industry 3694; and those manufacturing generators for welding equipment are classified in industry 3548. Products of this industry also are collected in the Current Industrial Report MA36H, Motors and Generators.

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1987 Census of Manufactures, Industry 3621, Motors and Generators, had employment of 74.6 thousand. The employment figure was 11 percent below the 84.2 thousand reported in 1982. The leading States in employment in 1987 were Ohio, Arkansas, Wisconsin, and New York. These same States were the leaders in 1982.

The total value of shipments for establishments classified in this industry was \$6.8 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3621 shipped \$6.2 billion of motor and generator products considered primary to the industry, \$350.6 million of secondary products, and had \$170.5 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 95 percent (specialization ratio). In 1982, the specialization ratio was 94 percent.

Establishments in this industry also accounted for 89 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio was 81 percent. The products primary to industry 3621, no matter in what industry they were produced, appear in table 6a and aggregate to \$7.0 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the motors and generators industry amounted to \$3.0 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 6 percent of total value of shipments.

INDUSTRY 3624, CARBON AND GRAPHITE PRODUCTS

This industry is made up of establishments primarily engaged in manufacturing carbon, graphite, and metal-graphite brushes and brush stock; carbon or graphite electrodes for thermal and electrolytic uses; carbon and graphite fibers; and other carbon, graphite, and metal-graphite products.

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1987 Census of Manufactures, Industry 3624, Carbon and Graphite Products, had employment of 9.8 thousand. The employment figure was 18 percent below

the 12.0 thousand reported in 1982. The leading States in employment in 1987 were New York, North Carolina, Ohio, and Pennsylvania. These same States were the leaders in 1982.

The total value of shipments for establishments classified in this industry was \$1.2 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3624 shipped \$1.1 billion of carbon and graphite products considered primary to the industry, \$40.6 million of secondary products, and had \$89.4 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 96 percent (specialization ratio). In 1982, the specialization ratio was 94 percent.

Establishments in this industry also accounted for 91 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio was 93 percent. The products primary to industry 3624, no matter in what industry they were produced, appear in table 6a and aggregate to \$1.2 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the carbon and graphite products industry amounted to \$613.1 million. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 4 percent of total value of shipments.

INDUSTRY 3625, RELAYS AND INDUSTRIAL CONTROLS

This industry is made up of establishments primarily engaged in manufacturing relays; motor starters and controllers; and other industrial controls and control accessories. Establishments primarily engaged in manufacturing automatic temperature controls are classified in industry 3822, and those manufacturing industrial process control instruments are classified in industry 3823. Products of this industry also are collected in the Current Industrial Report MA36A, Switchgear, Switchboard Apparatus, Relays, and Industrial Controls.

Industry 3625, Relays and Industrial Controls, is a combination of part of 1972-based industry 3622 and 36794. The effect of the revisions on the data is summarized in tables 1c-1 and 1c-2. During the 1987 processing,

each establishment was classified according to both the old and new SIC. Table 1c-1 shows the distribution of the new industry among the old SIC classifications. Table 1c-2 shows the distribution of the old SIC-based industries among the new SIC classifications. See report MC87-I-36E for statistics on old industry 3679.

In the 1987 Census of Manufactures, Industry 3625, Relays and Industrial Controls, had employment of 66.6 thousand. The leading States in employment were Wisconsin, California, Ohio, and Pennsylvania, accounting for 36 percent of the industries employment.

The total value of shipments for establishments classified in this industry was \$6.1 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3625 shipped \$5.5 billion of relays and industrial controls products considered primary to the industry, \$317.6 million of secondary products, and had \$330.7 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 94 percent (specialization ratio).

Establishments in this industry also accounted for 90 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). The products primary to industry 3625, no matter in what industry they were produced, appear in table 6a and aggregate to \$6.0 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the relays and industrial controls industry amounted to \$2.3 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 7 percent of total value of shipments.

INDUSTRY 3629, ELECTRICAL INDUSTRIAL APPARATUS, N.E.C.

This industry is made up of establishments primarily engaged in manufacturing industrial and commercial electric apparatus and equipment, not elsewhere classified,

such as fixed and variable capacitors and rectifiers for industrial applications. Establishments primarily engaged in manufacturing electronic capacitors and rectifiers are classified in industry group 367.

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1987 Census of Manufactures, Industry 3629, Electrical Industrial Apparatus, N.E.C., had employment of 14.5 thousand. The employment figure was 11 percent below the 16.3 thousand reported in 1982. The leading States in employment in 1987 were California, Indiana, New York, and Illinois. This represents a shift from 1982 when California, New York, Ohio, and Indiana were the leading States.

The total value of shipments for establishments classified in this industry was \$1.2 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3629 shipped \$1.0 billion of electrical industrial apparatus, n.e.c., products considered primary to the industry, \$133.5 million of secondary products, and had \$41.8 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 88 percent (specialization ratio). In 1982, the specialization ratio was 87 percent.

Establishments in this industry also accounted for 87 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio was 92 percent. The products primary to industry 3629, no matter in what industry they were produced, appear in table 6a and aggregate to \$1.2 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the electrical industrial apparatus, n.e.c., industry amounted to \$483.8 million. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 16 percent of total value of shipments.

Table 1a-1. Historical Statistics for the Industry (1987 Basis): 1987 and Earlier Years

[Industries with only 1987 data are revised for 1987. Table 1a-2 contains historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year ¹	Companies ² (no.)	All establishments ³		All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments (million dollars)	New capital expenditures ⁶ (million dollars)	End-of-year inventories ⁴ (million dollars)	Ratios	
		Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Specialization ⁷ (per cent)	Coverage ⁸ (per cent)
INDUSTRY 3612, TRANSFORMERS, EXCEPT ELECTRONIC															
1987 Census ---	239	286	154	32.2	720.4	24.4	46.7	470.5	1 615.4	1 656.4	3 289.5	66.0	479.2	95	98
1986 ASM -----	(NA)	(NA)	(NA)	34.3	746.7	25.9	49.4	494.6	1 591.8	1 674.8	3 298.4	66.2	519.4	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	35.3	752.1	26.6	49.5	492.5	1 558.4	1 721.4	3 288.5	79.1	541.6	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	37.1	761.4	28.3	52.7	501.8	1 534.1	1 686.1	3 170.3	82.8	571.9	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	36.6	708.0	27.1	49.8	456.6	1 397.3	1 425.3	2 867.0	63.2	500.8	(NA)	(NA)
1982 Census ---	240	293	162	39.0	732.1	28.5	51.3	461.0	1 439.1	1 421.8	2 916.0	76.5	537.2	94	96
1981 ASM -----	(NA)	(NA)	(NA)	45.9	771.7	34.4	65.5	502.1	1 578.1	1 665.7	3 208.8	80.5	513.1	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	44.9	705.2	33.7	65.7	468.4	1 440.6	1 500.5	2 957.4	83.6	456.0	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	46.6	649.1	35.9	68.0	437.8	1 414.6	1 351.3	2 728.7	72.6	470.9	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	44.6	596.0	34.0	63.9	395.6	1 280.7	1 193.7	2 451.6	63.0	419.6	(NA)	(NA)
1977 Census ---	229	279	143	43.3	529.6	32.8	62.5	349.8	1 162.7	1 061.8	2 201.8	67.2	385.8	95	97
1976 ASM -----	(NA)	(NA)	(NA)	38.8	437.4	28.9	53.2	285.1	939.7	872.9	1 812.0	32.6	326.4	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	40.3	444.7	29.7	56.2	290.4	916.6	854.6	1 805.2	35.2	321.9	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	49.6	500.6	38.4	75.3	353.7	1 006.4	1 009.5	1 974.5	47.2	385.6	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	50.7	466.4	39.8	78.4	326.4	890.2	804.0	1 663.1	36.4	319.6	(NA)	(NA)
1972 Census ---	168	216	136	46.8	420.2	35.6	71.3	286.1	757.3	700.5	1 461.9	26.8	258.7	96	97
INDUSTRY 3613, SWITCHGEAR AND SWITCHBOARD APPARATUS ⁹															
1987 Census ---	370	474	256	44.4	1 057.8	29.4	57.1	594.7	2 888.7	1 969.0	4 907.3	120.5	755.1	92	93
INDUSTRY 3621, MOTORS AND GENERATORS															
1987 Census ---	349	462	302	74.6	1 663.5	56.5	110.2	1 099.7	3 815.2	2 962.9	6 753.1	201.6	1 130.7	95	89
1986 ASM -----	(NA)	(NA)	(NA)	75.6	1 681.7	55.5	108.1	1 081.9	3 623.4	2 921.1	6 608.1	232.7	1 138.0	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	77.6	1 648.9	57.8	112.1	1 098.4	3 668.1	2 888.7	6 583.6	262.5	1 183.4	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	84.2	1 743.5	63.3	124.5	1 148.0	3 929.3	2 915.7	6 760.5	244.9	1 254.6	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	80.4	1 555.0	60.1	114.4	1 003.8	3 372.5	2 647.7	6 002.0	204.6	1 145.6	(NA)	(NA)
1982 Census ---	349	472	325	84.2	1 546.4	61.0	114.4	984.2	3 435.8	2 526.4	6 060.1	275.4	1 087.9	94	81
1981 ASM -----	(NA)	(NA)	(NA)	93.4	1 608.5	70.3	137.0	1 089.3	3 634.7	2 747.4	6 316.4	235.8	1 049.4	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	94.1	1 478.9	69.6	136.6	987.9	3 119.1	2 503.3	5 648.2	183.2	984.8	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	107.1	1 512.1	81.7	161.1	1 036.8	3 279.7	2 552.4	5 728.3	176.9	1 035.4	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	106.1	1 370.3	82.0	160.2	941.5	2 963.4	2 281.6	5 185.5	176.7	896.6	(NA)	(NA)
1977 Census ---	340	446	298	96.9	1 176.7	74.1	149.7	802.1	2 609.9	1 915.9	4 458.7	160.9	770.3	92	80
1976 ASM -----	(NA)	(NA)	(NA)	90.7	1 009.1	70.7	137.2	691.7	2 194.8	1 601.8	3 726.5	131.5	638.1	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	82.0	850.9	60.6	118.7	567.6	1 719.4	1 364.1	3 137.2	94.3	547.5	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	100.2	957.7	77.7	152.5	654.1	1 923.6	1 553.0	3 383.3	117.9	679.1	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	100.6	900.8	79.0	156.9	630.0	1 720.6	1 295.0	2 989.0	85.3	565.1	(NA)	(NA)
1972 Census ---	325	426	258	90.3	764.4	69.2	139.3	516.9	1 475.2	1 054.8	2 501.7	58.9	466.8	91	81
INDUSTRY 3624, CARBON AND GRAPHITE PRODUCTS															
1987 Census ---	77	95	64	9.8	262.7	7.0	14.8	165.9	604.4	613.1	1 224.5	47.3	383.3	96	91
1986 ASM -----	(NA)	(NA)	(NA)	9.3	240.3	6.6	13.5	152.0	508.9	587.7	1 136.3	38.5	360.7	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	10.2	260.8	7.3	15.2	168.5	379.4	633.8	1 120.6	52.3	406.3	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	11.4	276.5	8.3	17.2	182.0	584.6	655.9	1 222.8	68.9	520.9	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	10.8	246.1	7.5	15.2	151.4	476.9	446.9	994.6	125.0	504.4	(NA)	(NA)
1982 Census ---	70	90	59	12.0	258.2	8.4	16.6	164.8	550.1	463.3	971.4	151.8	600.1	94	93
1981 ASM -----	(NA)	(NA)	(NA)	13.0	256.8	9.6	19.2	171.2	799.3	717.1	1 360.6	144.8	484.9	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	13.3	241.9	9.7	19.4	166.0	661.0	544.5	1 183.3	86.4	291.5	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	13.3	223.8	10.0	20.2	157.8	644.2	524.5	1 145.2	43.1	259.7	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	12.5	183.3	9.5	18.8	128.7	499.1	393.7	890.6	33.5	222.5	(NA)	(NA)
1977 Census ---	58	74	48	12.1	164.1	9.0	17.7	110.9	408.4	337.5	735.2	35.4	215.9	94	93
1976 ASM -----	(NA)	(NA)	(NA)	12.0	152.8	8.9	16.8	102.2	399.3	339.1	691.4	63.3	211.4	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	11.3	128.5	8.3	15.6	86.4	375.1	244.9	594.2	61.1	154.0	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	12.6	134.9	9.6	19.3	96.6	342.5	278.5	613.0	22.1	123.8	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	12.2	115.8	9.5	19.2	84.6	264.5	190.3	452.5	20.0	102.7	(NA)	(NA)
1972 Census ---	58	72	44	11.3	99.6	8.6	16.7	70.9	217.4	158.2	377.4	20.2	98.4	95	98
INDUSTRY 3625, RELAYS AND INDUSTRIAL CONTROLS ⁹															
1987 Census ---	1 100	1 168	439	66.6	1 630.7	37.6	72.7	697.3	3 781.2	2 292.7	6 100.5	165.5	1 277.6	94	90
INDUSTRY 3629, ELECTRICAL INDUSTRIAL APPARATUS, N.E.C.															
1987 Census ---	472	481	106	14.5	325.1	8.9	17.7	159.8	698.4	483.8	1 188.2	31.9	261.6	88	87
1986 ASM -----	(NA)	(NA)	(NA)	16.0	355.2	10.6	20.0	185.0	762.5	564.8	1 327.6	29.4	273.8	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	17.7	362.3	11.3	21.9	189.8	767.1	585.9	1 353.4	31.5	277.7	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	17.2	342.6	11.3	21.8	189.4	765.1	573.3	1 318.0	33.0	244.9	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	13.9	257.6	9.7	18.8	142.8	641.0	465.8	1 112.8	35.2	189.6	(NA)	(NA)
1982 Census ---	309	323	120	16.3	280.4	11.3	21.5	154.5	644.7	456.3	1 111.3	29.3	230.9	87	92
1981 ASM -----	(NA)	(NA)	(NA)	16.8	282.6	12.1	24.6	157.4	653.6	536.5	1 179.9	38.3	234.8	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	18.1	265.0	12.8	25.3	154.4	621.9	470.1	1 083.0	43.1	210.8	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	19.6	253.9	14.5	27.7	156.7	580.8	418.7	982.7	30.4	201.5	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	19.7	232.7	14.8	28.2	145.1	496.9	367.3	851.5	24.4	167.9	(NA)	(NA)
1977 Census ---	214	223	102	16.5	188.6	12.2	23.4	113.4	411.0	294.0	692.4	16.8	140.0	87	81
1976 ASM -----	(NA)	(NA)	(NA)	19.6	203.0	14.2	27.1	132.1	417.9	301.6	706.9	19.3	156.1	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	17.4	166.0	12.3	24.4	96.6	329.2	257.0	593.9	17.4	140.7	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	22.5	193.9	16.6	32.7	120.8	397.3	298.7	683.8	15.9	177.2	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	23.7	199.0	16.9	34.5	115.1	340.4	310.0	634.0	21.8	127.7	(NA)	(NA)
1972 Census ---	245	258	121	20.2	165.0	13.5	26.0	89.4	270.0	187.4	449.4	11.2	99.2	85	80

¹In annual survey of manufactures (ASM) years, data are estimates based on a representative sample of establishments canvassed annually and may differ from results of a complete canvass of all establishments. ASM publication shows percentage standard errors. Unless otherwise noted, for data prior to 1972, see 1972 Census of Manufactures, vol. II, table 1a of the industry chapter.

²For the Census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

³Includes establishments with payroll at any time during year.

Table 1a-1. **Historical Statistics for the Industry (1987 Basis): 1987 and Earlier Years—Con.**

⁴Beginning with the 1982 Census of Manufactures, all respondents were requested to report their inventories at (the lower of) cost or market prior to adjustment to LIFO cost. This is a change from prior Censuses and annual surveys of manufactures in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, inventories and value added by manufacture are not comparable to prior-year data.

⁵Detailed data on materials consumed by type are shown in table 7.

⁶Detailed data on new machinery and equipment expenditures are provided in table 3c.

⁷Represents ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for establishments classified in the industry.

⁸Represents ratio of primary products shipped by establishments classified in industry to total shipments of such products by all manufacturing establishments, wherever classified.

⁹Industry definition is new for 1987 Census of Manufactures. An explanation of the Standard Industrial Classifications revision appears in the Summary of Findings of this report.

Table 1a-2. **Historical Statistics for the Industry (1972 Basis): 1987 and Earlier Years**

[Table 1a-2 contains the historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Companies (no.)	All establishments		All employees		Production workers			Value added by manufac- ture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expendi- tures (million dollars)	End-of- year inven- tones (million dollars)	Ratios	
		Total (no.)	With 20 employ- ees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Special- ization (per- cent)	Cover- age (per- cent)
INDUSTRY 3613, SWITCHGEAR AND SWITCHBOARD APPARATUS															
1987 Census ---	428	539	292	50.8	1 208.9	34.0	66.3	679.4	3 249.9	2 123.3	5 425.4	140.1	863.5	(NA)	(NA)
1986 ASM -----	(NA)	(NA)	(NA)	55.6	1 272.5	37.6	72.6	726.7	3 292.9	2 195.4	5 504.7	178.7	1 004.5	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	58.1	1 273.5	39.6	76.4	743.9	3 388.1	2 254.7	5 676.3	155.0	1 052.6	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	62.8	1 321.6	42.3	81.9	761.3	3 559.2	2 184.6	5 696.2	151.7	1 126.4	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	62.3	1 248.2	42.3	80.3	706.4	3 151.2	2 001.5	5 158.7	137.0	1 071.1	(NA)	(NA)
1982 Census ---	514	649	336	66.3	1 262.5	44.7	83.6	718.3	3 145.0	1 953.8	5 192.2	143.2	1 056.4	91	93
1981 ASM -----	(NA)	(NA)	(NA)	70.9	1 259.1	49.3	95.4	744.8	3 248.3	1 934.6	5 135.0	138.5	1 011.6	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	72.3	1 165.6	50.0	97.0	693.8	2 994.4	1 991.7	4 934.0	130.2	951.1	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	76.4	1 102.9	54.4	105.3	687.1	2 764.3	1 795.0	4 474.8	117.3	854.0	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	75.1	1 001.1	54.2	104.2	621.6	2 455.1	1 648.3	4 054.6	90.2	755.6	(NA)	(NA)
1977 Census ---	541	667	315	71.4	896.1	51.7	99.1	556.8	2 151.8	1 429.8	3 541.0	73.1	647.5	91	91
1976 ASM -----	(NA)	(NA)	(NA)	65.3	755.9	45.9	85.6	462.1	1 761.8	1 144.6	2 876.0	52.6	568.7	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	64.7	709.2	44.5	82.5	428.5	1 575.3	1 046.3	2 660.9	33.9	526.3	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	73.2	743.7	53.2	104.0	474.5	1 629.6	1 102.3	2 668.7	57.3	591.2	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	74.4	704.0	53.8	107.1	446.7	1 514.2	994.9	2 461.9	48.1	504.2	(NA)	(NA)
1972 Census ---	463	568	283	69.2	619.8	49.6	97.1	388.5	1 303.0	844.2	2 123.5	36.9	413.1	91	89
INDUSTRY 3622, INDUSTRIAL CONTROLS															
1987 Census ---	995	1 042	361	52.5	1 334.5	28.0	53.9	541.3	3 127.4	2 000.1	5 149.8	127.5	1 071.1	(NA)	(NA)
1986 ASM -----	(NA)	(NA)	(NA)	55.9	1 347.1	31.8	62.6	593.5	3 164.3	2 112.9	5 273.1	157.7	1 175.7	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	58.5	1 387.8	32.5	64.0	588.6	3 113.7	2 067.0	5 120.4	170.6	1 173.6	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	62.9	1 442.5	36.6	70.4	641.9	3 101.6	2 060.3	5 120.4	172.5	1 203.8	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	57.3	1 245.2	31.4	58.9	530.4	2 495.8	1 650.8	4 169.8	94.9	982.8	(NA)	(NA)
1982 Census ---	852	913	407	64.0	1 279.7	34.4	65.3	558.9	2 604.0	1 665.3	4 329.1	178.8	1 050.3	93	87
1981 ASM -----	(NA)	(NA)	(NA)	67.2	1 245.6	39.5	75.6	601.6	2 768.5	1 690.4	4 445.6	173.5	941.5	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	67.2	1 118.1	41.3	80.5	572.0	2 498.3	1 580.3	4 014.6	153.7	940.1	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	64.6	972.5	41.2	81.0	526.0	2 247.5	1 327.2	3 475.2	103.2	821.1	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	62.7	877.9	38.9	75.4	454.6	1 944.5	1 195.0	3 117.3	118.4	722.3	(NA)	(NA)
1977 Census ---	675	727	284	55.5	727.5	35.4	69.1	380.6	1 604.2	963.3	2 514.6	57.6	616.8	87	86
1976 ASM -----	(NA)	(NA)	(NA)	56.4	682.2	36.9	70.3	376.9	1 422.0	925.0	2 326.2	55.7	559.2	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	57.1	646.0	36.4	69.3	352.3	1 273.9	843.2	2 133.4	41.6	529.5	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	63.9	661.8	43.6	86.0	389.9	1 346.1	875.6	2 172.4	48.1	535.3	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	57.2	556.1	38.4	76.0	307.8	1 097.7	688.7	1 729.9	36.2	413.3	(NA)	(NA)
1972 Census ---	544	588	216	51.1	465.6	33.4	66.6	257.1	908.4	555.4	1 424.1	46.8	331.8	79	84

Note: For qualifications of data, see footnotes on table 1a-1.

Table 1b-1. **Selected Operating Ratios for the Industry (1987 Basis): 1987 and Earlier Years**

[Industries with only 1987 data are revised for 1987. Table 1b-2 contains historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3612, TRANSFORMERS, EXCEPT ELECTRONIC									
1987 Census -----	22 373	76	1 914	10.07	50	72	50 168	45	34.59
1986 ASM -----	21 769	76	1 907	10.01	51	73	46 408	47	32.22
1985 ASM -----	21 305	75	1 861	9.95	52	75	44 147	48	31.48
1984 ASM -----	20 522	76	1 862	9.52	53	77	41 350	50	29.11
1983 ASM -----	19 344	74	1 838	9.17	50	74	38 178	51	28.06
1982 Census ---	18 771	73	1 800	8.99	49	74	36 900	51	28.05
1981 ASM -----	16 812	75	1 904	7.67	52	76	34 381	49	24.09
1980 ASM -----	15 706	75	1 950	7.13	51	75	32 085	49	21.93
1979 ASM -----	13 929	77	1 894	6.44	50	73	30 356	46	20.80
1978 ASM -----	13 363	76	1 879	6.19	49	73	28 715	47	20.04
1977 Census ---	12 230	76	1 905	5.60	48	72	26 852	46	18.60
1976 ASM -----	11 273	74	1 841	5.36	48	72	24 219	47	17.66
1975 ASM -----	11 034	74	1 892	5.17	47	72	22 744	49	16.31
1974 ASM -----	10 092	77	1 961	4.70	51	76	20 290	50	13.37
1973 ASM -----	9 199	79	1 970	4.16	48	76	17 558	52	11.35
1972 Census ---	8 978	76	2 003	4.01	48	77	16 182	55	10.62

See footnotes at end of table.

Table 1b-1. Selected Operating Ratios for the Industry (1987 Basis): 1987 and Earlier Years
— Con.

[Industries with only 1987 data are revised for 1987. Table 1b-2 contains historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3613, SWITCHGEAR AND SWITCHBOARD APPARATUS									
1987 Census	23 824	66	1 942	10.42	40	62	65 061	37	50.59
INDUSTRY 3621, MOTORS AND GENERATORS									
1987 Census	22 299	76	1 950	9.98	44	69	51 142	44	34.62
1986 ASM	22 244	73	1 948	10.01	44	70	47 929	46	33.52
1985 ASM	21 248	74	1 939	9.80	44	69	47 269	45	32.72
1984 ASM	20 706	75	1 967	9.22	43	69	46 666	44	31.56
1983 ASM	19 340	75	1 903	8.77	44	70	41 947	46	29.48
1982 Census	18 365	72	1 875	8.60	42	67	40 805	45	30.03
1981 ASM	17 221	75	1 949	7.95	43	69	38 915	44	26.53
1980 ASM	15 716	74	1 963	7.23	44	71	33 147	47	22.83
1979 ASM	14 118	76	1 972	6.44	45	71	30 623	46	20.36
1978 ASM	12 915	77	1 954	5.88	44	70	27 930	46	18.50
1977 Census	12 143	76	2 020	5.36	43	69	26 934	45	17.43
1976 ASM	11 125	78	1 941	5.04	43	70	24 198	46	16.00
1975 ASM	10 376	74	1 959	4.78	43	71	20 968	49	14.49
1974 ASM	9 557	78	1 963	4.29	46	74	19 198	50	12.61
1973 ASM	8 954	79	1 986	4.02	43	73	17 103	52	10.97
1972 Census	8 465	77	2 013	3.71	42	73	16 337	52	10.59
INDUSTRY 3624, CARBON AND GRAPHITE PRODUCTS									
1987 Census	26 806	71	2 114	11.21	50	72	61 673	43	40.84
1986 ASM	25 838	71	2 045	11.26	52	73	54 720	47	37.70
1985 ASM	25 568	72	2 082	11.09	57	80	37 196	69	24.96
1984 ASM	24 254	73	2 072	10.58	54	76	51 281	47	33.99
1983 ASM	22 787	69	2 027	9.96	45	70	44 157	52	31.38
1982 Census	21 516	70	1 976	9.93	48	74	45 842	47	33.14
1981 ASM	19 753	74	2 000	8.92	53	72	61 485	32	41.63
1980 ASM	18 187	73	2 000	8.56	46	66	49 699	37	34.07
1979 ASM	16 827	75	2 020	7.81	46	65	48 436	35	31.89
1978 ASM	14 664	76	1 979	6.85	44	65	39 928	37	26.55
1977 Census	13 561	74	1 967	6.27	46	68	33 752	40	23.07
1976 ASM	12 733	74	1 888	6.08	49	71	33 275	38	23.77
1975 ASM	11 371	73	1 880	5.54	41	63	33 195	34	24.04
1974 ASM	10 706	76	2 010	5.01	45	67	27 183	39	17.75
1973 ASM	9 491	78	2 021	4.41	42	68	21 680	44	13.78
1972 Census	8 814	76	1 942	4.25	42	68	19 239	46	13.02
INDUSTRY 3625, RELAYS AND INDUSTRIAL CONTROLS									
1987 Census	24 485	56	1 934	9.59	38	64	56 775	43	52.01
INDUSTRY 3629, ELECTRICAL INDUSTRIAL APPARATUS, N.E.C.									
1987 Census	22 421	61	1 989	9.03	41	68	48 166	47	39.46
1986 ASM	22 200	66	1 887	9.25	43	69	47 656	47	38.13
1985 ASM	20 468	64	1 938	8.67	43	70	43 339	47	35.03
1984 ASM	19 918	66	1 929	8.69	43	69	44 483	45	35.10
1983 ASM	18 532	70	1 938	7.60	42	65	46 115	40	34.10
1982 Census	17 202	69	1 903	7.19	41	66	39 552	43	29.99
1981 ASM	16 821	72	2 033	6.40	45	69	38 905	43	26.57
1980 ASM	14 640	71	1 977	6.10	43	68	34 359	43	24.58
1979 ASM	12 954	74	1 910	5.66	43	68	29 633	44	20.97
1978 ASM	11 812	75	1 905	5.15	43	70	25 223	47	17.62
1977 Census	11 430	74	1 918	4.85	42	70	24 909	46	17.56
1976 ASM	10 357	72	1 908	4.87	43	71	21 321	49	15.42
1975 ASM	9 540	71	1 984	3.96	43	71	18 920	50	13.49
1974 ASM	8 617	74	1 970	3.69	44	72	17 658	49	12.15
1973 ASM	8 396	71	2 041	3.34	49	80	14 363	58	9.87
1972 Census	8 168	67	1 926	3.44	42	78	13 366	61	10.38

Note: For qualifications of data, see footnotes on table 1a-1.

Table 1b-2. Selected Operating Ratios for the Industry (1972 Basis): 1987 and Earlier Years

[Table 1b-2 contains the historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3613, SWITCHGEAR AND SWITCHBOARD APPARATUS									
1987 Census	23 797	67	1 950	10.25	39	61	63 974	37	49.02
1986 ASM	22 886	68	1 931	10.01	40	63	59 225	39	45.36
1985 ASM	21 919	68	1 929	9.74	40	62	58 315	38	44.35
1984 ASM	21 044	67	1 936	9.30	38	62	56 675	37	43.46
1983 ASM	20 035	68	1 898	8.80	39	63	50 581	40	39.24
1982 Census	19 042	67	1 870	8.59	38	62	47 436	40	37.62
1981 ASM	17 758	70	1 935	7.81	38	62	45 815	39	34.05
1980 ASM	16 121	69	1 940	7.15	40	64	41 416	39	30.87
1979 ASM	14 435	71	1 936	6.53	40	65	36 182	40	26.25
1978 ASM	13 330	72	1 923	5.97	41	65	32 691	41	23.56
1977 Census	12 550	72	1 917	5.62	40	66	30 137	42	21.71
1976 ASM	11 575	70	1 865	5.40	40	66	26 980	43	20.58
1975 ASM	10 961	69	1 854	5.19	39	66	24 348	45	19.09
1974 ASM	10 159	73	1 955	4.56	41	69	22 262	46	15.67
1973 ASM	9 462	72	1 991	4.17	40	69	20 352	46	14.14
1972 Census	8 956	72	1 958	4.00	40	69	18 829	48	13.42
INDUSTRY 3622, INDUSTRIAL CONTROLS									
1987 Census	25 419	53	1 925	10.04	39	65	59 570	43	58.02
1986 ASM	24 098	57	1 969	9.48	40	66	56 606	43	50.55
1985 ASM	23 723	56	1 969	9.20	40	67	53 226	45	48.65
1984 ASM	22 933	58	1 923	9.12	40	68	49 310	47	44.06
1983 ASM	21 731	55	1 876	9.01	40	69	43 557	50	42.37
1982 Census	19 995	54	1 898	8.56	38	68	40 688	49	39.88
1981 ASM	18 535	59	1 914	7.96	38	66	41 198	45	36.62
1980 ASM	16 638	61	1 949	7.11	39	67	37 177	45	31.03
1979 ASM	15 054	64	1 966	6.49	38	66	34 791	43	27.75
1978 ASM	14 001	62	1 938	6.03	38	66	31 013	45	25.79
1977 Census	13 108	64	1 952	5.51	38	67	28 905	45	23.22
1976 ASM	12 095	65	1 905	5.36	40	69	25 213	48	20.23
1975 ASM	11 313	64	1 904	5.08	40	70	22 310	51	18.38
1974 ASM	10 356	68	1 972	4.53	40	71	21 066	49	15.65
1973 ASM	9 722	67	1 979	4.05	40	72	19 191	51	14.44
1972 Census	9 111	65	1 994	3.86	39	72	17 777	51	13.64

Note: For qualifications of data, see footnotes on table 1a-1.

Table 1c-1. 1987 Statistics for the Industry Showing the Distribution of 1987 SIC-Based Industries Among 1972 SIC-Based Industries

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
		Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
New Industry 3613, Switchgear and Switchboard Apparatus	474	44.4	1 057.8	29.4	57.1	594.7	2 888.7	1 969.0	4 907.3	120.5	755.1
Old Industry 3613, Switchgear and Switchboard Apparatus	474	44.4	1 057.8	29.4	57.1	594.7	2 888.7	1 969.0	4 907.3	120.5	755.1
New Industry 3625, Relays and Industrial Controls	1 168	66.6	1 630.7	37.6	72.7	697.3	3 781.2	2 292.7	6 100.5	165.5	1 277.6
Old Industry 3613, Switchgear and Switchboard Apparatus	65	6.4	151.1	4.6	9.2	84.7	361.2	154.2	518.1	19.5	108.4
Old Industry 3622, Industrial Controls	1 042	52.5	1 334.5	28.0	53.9	541.3	3 127.4	2 000.1	5 149.8	127.5	1 071.1
Old Industry 3679, Electronic Components, N.E.C.	61	7.7	145.1	5.0	9.5	71.3	292.6	138.4	432.6	18.5	98.2

Note: For qualifications of data, see footnotes on table 1a-1.

Table 1c-2. 1987 Statistics for the Industry Showing the Distribution of 1972 SIC-Based Industries Among 1987 SIC-Based Industries

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
		Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
Old Industry 3613, Switchgear and Switchboard Apparatus	539	50.8	1 208.9	34.0	66.3	679.4	3 249.9	2 123.3	5 425.4	140.1	863.5
New Industry 3613, Switchgear and Switchboard Apparatus	474	44.4	1 057.8	29.4	57.1	594.7	2 888.7	1 969.0	4 907.3	120.5	755.1
New Industry 3625, Relays and Industrial Controls	65	6.4	151.1	4.6	9.2	84.7	361.2	154.2	518.1	19.5	108.4
Old Industry 3622, Industrial Controls	1 042	52.5	1 334.5	28.0	53.9	541.3	3 127.4	2 000.1	5 149.8	127.5	1 071.1
New Industry 3625, Relays and Industrial Controls	1 042	52.5	1 334.5	28.0	53.9	541.3	3 127.4	2 000.1	5 149.8	127.5	1 071.1

Note: For qualifications of data, see footnotes on table 1a-1.

Table 2. Industry Statistics for Selected States: 1987 and 1982

[Excludes data for auxiliaries. States with 150 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1987											1982		
	E¹	All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees² (1,000)	Value added by manufacture (million dollars)
		Total (no.)	With 20 employees or more (no.)	Number² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
INDUSTRY 3612, TRANSFORMERS, EXCEPT ELECTRONIC														
United States -----	-	286	154	32.2	720.4	24.4	46.7	470.5	1 615.4	1 656.4	3 289.5	66.0	39.0	1 439.1
Alabama -----	-	5	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.5	7.4
Arkansas -----	-	4	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
California -----	E2	44	20	1.5	31.8	1.1	2.2	21.6	70.2	74.2	147.1	(D)	2.6	93.4
Florida -----	E1	11	5	.8	14.9	.7	1.3	10.5	35.6	30.1	65.8	1.3	.8	24.0
Georgia -----	-	5	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
Illinois -----	E1	24	10	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	3.0	118.3
Indiana -----	-	7	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
Iowa -----	-	3	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
Kentucky -----	-	5	5	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.6	16.9
Louisiana -----	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Massachusetts -----	-	8	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
Michigan -----	E8	4	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.4	11.8
Minnesota -----	E2	6	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Mississippi -----	-	7	6	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
Missouri -----	-	6	6	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
New Jersey -----	E1	24	9	1.7	32.3	1.5	2.9	24.8	50.7	65.6	118.5	2.1	1.6	35.1
New York -----	-	19	10	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.2	44.6
North Carolina -----	-	10	8	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.8	87.7
Ohio -----	-	14	8	1.1	23.7	.8	1.7	16.6	46.4	46.8	96.7	(D)	1.0	29.5
Pennsylvania -----	-	12	6	1.9	35.0	1.5	2.8	25.9	59.7	51.6	116.4	(D)	FF	(D)
Tennessee -----	-	6	4	.6	12.5	.4	.9	6.5	26.7	29.9	56.9	(D)	CC	(D)
Texas -----	E2	15	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.6	16.4
Virginia -----	-	10	6	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.2	59.1
Wisconsin -----	-	15	14	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	4.4	152.3
INDUSTRY 3613, SWITCHGEAR AND SWITCHBOARD APPARATUS														
United States -----	-	474	256	44.4	1 057.8	29.4	57.1	594.7	2 888.7	1 969.0	4 907.3	120.5	(NA)	(NA)
Alabama -----	-	8	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Arkansas -----	-	3	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
California -----	E1	49	32	3.3	78.7	1.9	4.3	43.5	184.8	157.8	346.9	(D)	(NA)	(NA)
Connecticut -----	-	15	8	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Florida -----	-	16	5	.5	10.5	.3	.6	5.8	31.9	31.8	64.2	.4	(NA)	(NA)
Georgia -----	-	17	10	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Idaho -----	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Illinois -----	-	46	27	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Indiana -----	-	4	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Iowa -----	-	7	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Kentucky -----	-	9	8	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Louisiana -----	E1	8	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Maryland -----	-	10	6	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Massachusetts -----	-	11	7	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Michigan -----	E1	23	11	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Minnesota -----	-	8	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Mississippi -----	-	3	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Missouri -----	-	12	6	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Nebraska -----	-	2	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Hampshire -----	-	4	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)

See footnotes at end of table.

Table 2. Industry Statistics for Selected States: 1987 and 1982—Con.

[Excludes data for auxiliaries. States with 150 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1987											1982		
	All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ² (1,000)	Value added by manufacture (million dollars)	
	E ¹	Total (no.)	With 20 employees or more (no.)	Number ² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)							Wages (million dollars)
INDUSTRY 3613, SWITCHGEAR AND SWITCHBOARD APPARATUS—Con.														
New Jersey	-	27	12	1.4	35.0	1.0	1.8	20.3	79.6	56.6	134.6	4.9	(NA)	(NA)
New Mexico	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New York	E1	22	13	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
North Carolina	E2	18	11	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Ohio	-	26	14	2.5	62.3	1.8	3.4	40.7	160.4	120.4	280.9	(D)	(NA)	(NA)
Oklahoma	-	4	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Oregon	-	6	5	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Pennsylvania	-	20	13	2.8	78.7	1.9	3.5	47.1	124.3	106.7	233.7	(D)	(NA)	(NA)
South Carolina	-	7	6	1.4	32.4	.9	1.9	19.3	105.3	80.8	184.4	5.6	(NA)	(NA)
Tennessee	-	8	5	1.0	22.8	.8	1.6	17.6	88.0	60.6	148.9	(D)	(NA)	(NA)
Texas	-	24	9	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Vermont	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Virginia	-	7	5	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Wisconsin	-	10	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
INDUSTRY 3621, MOTORS AND GENERATORS														
United States	-	462	302	74.6	1 663.5	56.5	110.2	1 099.7	3 815.2	2 962.9	6 753.1	201.6	84.2	3 435.8
Alabama	-	4	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.0	58.1
Arizona	-	3	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Arkansas	-	13	11	6.0	115.3	4.8	9.0	84.4	395.3	228.6	624.2	27.2	FF	(D)
California	E1	46	23	2.2	49.5	1.5	3.1	27.8	99.8	61.2	160.0	3.7	3.1	162.3
Connecticut	-	11	8	2.4	55.9	1.4	2.6	23.3	88.7	69.4	156.8	6.2	2.2	68.9
Florida	-	8	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.3	7.5
Georgia	-	5	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
Illinois	-	40	32	4.7	91.0	3.5	6.7	55.2	195.9	172.1	364.8	9.4	4.3	151.9
Indiana	-	26	18	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	5.6	216.3
Iowa	-	6	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Kansas	-	5	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Kentucky	-	4	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	2.1	75.7
Maryland	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Massachusetts	-	8	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.4	10.0
Michigan	-	14	10	1.8	35.8	1.5	2.9	28.6	80.2	72.3	150.6	(D)	1.8	46.7
Minnesota	-	14	12	3.4	93.0	1.9	3.7	50.0	198.5	181.7	379.9	12.3	4.0	187.3
Mississippi	-	8	8	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
Missouri	-	15	11	5.2	92.2	4.4	8.1	72.2	233.4	212.1	436.5	13.2	4.7	188.0
Nebraska	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Hampshire	E1	6	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
New Jersey	E1	17	10	1.2	29.1	.8	1.7	16.8	60.7	30.3	89.7	1.9	1.6	51.1
New York	-	29	19	5.6	164.3	4.5	8.9	125.3	422.4	381.1	811.2	23.2	8.4	443.3
North Carolina	-	14	13	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.7	70.4
Ohio	-	36	25	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	8.7	353.9
Oklahoma	-	4	3	.7	12.2	.5	1.0	7.5	50.6	24.3	73.9	1.3	.8	39.7
Pennsylvania	E1	27	18	3.5	80.1	2.6	5.0	47.0	164.4	130.4	273.4	6.5	5.3	263.8
Tennessee	E1	15	12	4.7	90.6	4.1	7.8	75.2	224.5	194.1	418.7	(D)	FF	(D)
Texas	E4	7	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.4	53.1
Virginia	-	10	7	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
Wisconsin	-	33	25	5.6	123.1	3.9	7.7	73.9	256.3	247.1	503.6	(D)	7.0	227.0
INDUSTRY 3624, CARBON AND GRAPHITE PRODUCTS														
United States	-	95	64	9.8	262.7	7.0	14.8	165.9	604.4	613.1	1 224.5	47.3	12.0	550.1
California	-	9	6	.4	8.5	.3	.6	5.1	19.3	21.0	39.1	2.1	.3	16.7
Kentucky	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Louisiana	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Michigan	-	6	4	.4	9.2	.2	.5	5.7	15.1	6.4	21.1	(D)	.5	18.8
New York	-	7	5	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.8	114.5
North Carolina	-	4	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
Ohio	-	12	8	.9	24.3	.6	1.5	16.3	43.5	35.2	78.1	5.8	1.2	45.2
Pennsylvania	-	12	9	2.4	64.8	1.7	3.6	39.2	113.7	72.0	187.1	3.6	3.2	111.0
South Carolina	-	4	4	.7	21.4	.5	1.1	13.1	64.4	72.9	136.0	(D)	CC	(D)
Tennessee	-	2	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Texas	-	5	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
West Virginia	-	2	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Wisconsin	-	3	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)

See footnotes at end of table.

Table 2. Industry Statistics for Selected States: 1987 and 1982—Con.

[Excludes data for auxiliaries. States with 150 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1987											1982		
	E ¹	All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ² (1,000)	Value added by manufacture (million dollars)
		Total (no.)	With 20 employees or more (no.)	Number ² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
INDUSTRY 3625, RELAYS AND INDUSTRIAL CONTROLS														
United States	-	1 168	439	66.6	1 630.7	37.6	72.7	697.3	3 781.2	2 292.7	6 100.5	165.5	(NA)	(NA)
Alabama	E4	13	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Arkansas	-	7	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
California	E1	157	42	6.0	139.9	3.1	6.1	52.1	326.2	155.6	485.7	8.3	(NA)	(NA)
Colorado	E3	11	3	.2	5.2	.1	.2	1.9	9.1	8.4	17.5	(D)	(NA)	(NA)
Connecticut	-	43	18	2.3	45.3	1.5	2.7	23.4	82.2	63.6	147.5	5.9	(NA)	(NA)
Florida	-	42	19	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Georgia	-	18	6	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Illinois	E1	96	40	4.5	105.2	2.8	5.5	45.8	204.5	178.8	387.9	9.7	(NA)	(NA)
Indiana	-	25	9	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Iowa	-	8	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Kansas	E3	15	5	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Kentucky	-	7	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Louisiana	-	5	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Maryland	-	9	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Massachusetts	E1	44	18	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Michigan	E1	67	25	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Minnesota	E1	36	14	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Missouri	E4	12	4	.3	7.7	.2	.4	4.1	18.6	9.9	28.5	.6	(NA)	(NA)
New Hampshire	E1	7	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Jersey	E1	54	16	1.7	39.3	1.1	2.0	19.6	90.9	46.2	137.2	7.3	(NA)	(NA)
New York	E1	76	30	3.8	80.4	2.5	4.7	37.5	165.5	96.4	266.4	5.9	(NA)	(NA)
North Carolina	-	28	16	4.4	99.4	3.0	5.8	56.4	319.0	207.1	537.3	10.1	(NA)	(NA)
Ohio	-	69	26	4.8	139.5	1.6	3.5	35.3	367.0	234.6	598.7	25.7	(NA)	(NA)
Oklahoma	E1	11	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Oregon	E3	19	5	.3	7.4	.1	.3	1.9	14.3	10.5	25.0	(D)	(NA)	(NA)
Pennsylvania	-	69	36	4.7	129.0	2.3	4.8	51.5	237.6	154.2	388.7	15.8	(NA)	(NA)
Rhode Island	-	5	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
South Carolina	-	10	5	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Tennessee	E1	13	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Texas	E2	56	26	1.8	41.7	.8	1.7	15.5	83.1	63.1	150.8	(D)	(NA)	(NA)
Utah	-	3	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Virginia	-	17	5	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Washington	E5	28	8	.5	12.2	.3	.6	5.2	22.8	15.1	37.3	.9	(NA)	(NA)
West Virginia	E5	6	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Wisconsin	-	53	24	8.5	233.8	5.3	9.8	107.2	506.2	264.3	780.4	19.2	(NA)	(NA)
INDUSTRY 3629, ELECTRICAL INDUSTRIAL APPARATUS, N.E.C.														
United States	E1	481	106	14.5	325.1	8.9	17.7	159.8	698.4	483.8	1 188.2	31.9	16.3	644.7
Arizona	E4	16	2	.3	4.9	.2	.3	2.7	9.6	8.8	18.9	(D)	AA	(D)
California	E1	96	17	3.2	78.4	2.0	4.3	38.2	149.3	83.7	231.4	8.3	3.3	116.8
Connecticut	E4	16	3	.3	9.0	.2	.4	4.0	19.5	10.1	28.9	.8	.4	14.7
Illinois	-	23	7	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.0	31.6
Indiana	-	21	8	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.4	46.5
Massachusetts	E6	17	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.8	23.6
Michigan	E2	21	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.4	12.8
Minnesota	E2	9	4	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Montana	-	3	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Nebraska	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Jersey	E3	17	5	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.3	7.9
New York	E2	26	9	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
North Carolina	-	8	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Ohio	E1	28	9	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.9	97.4
Pennsylvania	E5	24	4	.3	5.5	.2	.4	3.2	14.3	9.4	23.7	.5	.5	30.5
South Carolina	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Texas	E1	31	7	.5	10.6	.3	.6	4.9	31.4	23.0	55.1	(D)	.5	33.1
Vermont	-	3	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
Washington	E2	11	2	.2	3.7	.2	.3	2.4	7.6	3.8	11.4	.2	(NA)	(NA)
Wisconsin	E1	13	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.3	7.4

Note: For qualifications of data, see footnotes on table 1a-1.

¹Payroll and sales data for some small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other Government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown for those States where estimated value of shipments data based on administrative-record data account for 10 percent or more of figure shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Statistics for some producing States have been withheld to avoid disclosing data for individual companies. However, for States with 150 employees or more, number of establishments is shown and employment-size range is indicated by one of the following symbols: AA—150 to 249 employees; BB—250 to 499 employees; CC—500 to 999 employees; EE—1,000 to 2,499 employees; FF—2,500 employees or more.

Table 3a. Summary Statistics for the Industry: 1987

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Transformers, except electronic (SIC 3612)	Switchgear and switchboard apparatus (SIC 3613)	Motors and generators (SIC 3621)	Carbon and graphite products (SIC 3624)	Relays and industrial controls (SIC 3625)	Electrical industrial apparatus, n.e.c. (SIC 3629)
Companies number..	239	370	349	77	1 100	472
All establishments do..	286	474	462	95	1 168	481
With 1 to 19 employees do..	132	218	160	31	729	375
With 20 to 99 employees do..	77	137	125	36	302	71
With 100 employees or more do..	77	119	177	28	137	35
Employment and labor costs:						
Employees 1,000..	32.2	44.4	74.6	9.8	66.6	14.5
Compensation, total mil dol..	906.4	1 344.4	2 062.2	334.5	2 019.9	390.4
Annual payroll do..	720.4	1 057.8	1 663.5	262.7	1 630.7	325.1
Fringe benefits do..	186.1	286.7	398.8	71.8	389.2	65.3
Social Security and other legally required payments do..	68.9	105.7	161.7	30.6	154.8	26.4
Employer payments and other programs do..	117.1	181.0	237.1	41.2	234.4	38.9
Production workers:						
Average for year 1,000..	24.4	29.4	56.5	7.0	37.6	8.9
March do..	24.6	29.3	57.0	6.9	37.9	8.8
May do..	24.6	29.2	56.3	7.0	37.4	8.8
August do..	24.0	29.2	55.5	7.1	37.2	9.0
November do..	24.1	29.4	57.0	7.1	37.5	9.0
Hours millions..	46.7	57.1	110.2	14.8	72.7	17.7
January to March do..	11.9	14.1	27.8	3.6	18.3	4.4
April to June do..	12.2	14.3	27.5	3.7	18.3	4.4
July to September do..	11.0	14.2	27.0	3.7	17.8	4.4
October to December do..	11.6	14.5	27.9	3.8	18.2	4.5
Wages mil dol..	470.5	594.7	1 099.7	165.9	697.3	159.8
Value added by manufacture do..	1 615.4	2 888.7	3 815.2	604.4	3 781.2	698.4
Cost of materials ¹ do..	1 656.4	1 969.0	2 962.9	613.1	2 292.7	483.8
Materials, parts, containers, etc., consumed ² do..	1 552.4	1 693.5	2 760.3	444.4	2 043.5	446.0
Resales do..	42.4	204.1	77.5	76.0	149.5	17.0
Fuels do..	14.0	9.8	22.3	29.1	12.5	2.8
Purchased electricity do..	39.9	35.8	73.4	57.0	46.0	11.4
Contract work do..	7.7	25.8	29.3	6.6	41.2	6.5
Quantity of electric energy used for heat and power:						
Purchased mil kWh..	772.2	617.4	1 401.1	1 661.4	828.3	189.3
Generated less sold do..	(S)	-	-	-	-	-
Total value of shipments mil dol..	3 289.5	4 907.3	6 753.1	1 224.5	6 100.5	1 188.2
Primary products do..	3 065.0	4 271.4	6 232.0	1 094.4	5 452.1	1 012.9
Secondary products do..	150.4	360.9	350.6	40.6	317.6	133.5
Miscellaneous receipts, total do..	74.1	275.0	170.5	89.4	330.7	41.8
Value of resales do..	53.0	243.8	97.1	83.4	247.6	23.3
Contract receipts do..	1.5	9.3	32.3	4.6	18.8	(D)
Sales of scrap and refuse do..	2.8	5.6	16.3	(X)	(X)	(X)
Receipts for repair work do..	(X)	2.2	9.8	(X)	(X)	(X)
Other miscellaneous receipts do..	16.8	14.1	15.1	(X)	(X)	(X)
Miscellaneous receipts, n.s.k. do..	(X)	(X)	(X)	1.5	64.4	(D)
Inventories by stage of fabrication:						
Beginning of 1987 mil dol..	492.3	818.5	1 113.4	386.2	1 292.6	263.6
Finished goods do..	126.0	240.2	317.2	88.1	290.0	79.3
Work in process do..	190.3	287.7	405.6	212.9	514.7	77.4
Materials and supplies do..	175.9	290.6	390.7	85.2	488.0	106.9
End of 1987 do..	479.2	755.1	1 130.7	383.3	1 277.6	261.6
Finished goods do..	112.2	199.7	312.6	85.4	300.7	76.9
Work in process do..	186.5	278.7	435.2	208.6	477.4	73.7
Materials and supplies do..	180.6	276.8	382.9	89.3	499.5	111.0
Primary product specialization ratio percent..	95	92	95	96	94	88
Coverage ratio do..	98	93	89	91	90	87

Note: For qualifications of data, see footnotes on table 1a-1.

¹Data on purchased services for the repair of buildings and machinery and for communication services are not included in cost of materials, etc., but are shown in table 3c.

²Data on materials consumed by type are shown in table 7. Data on amount purchased or transferred from foreign sources are shown in table 3c.

Table 3b. Gross Book Value of Depreciable Assets, Capital Expenditures, Retirements, Depreciation, and Rental Payments: 1987

[Million dollars. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Transformers, except electronic (SIC 3612)	Switchgear and switchboard apparatus (SIC 3613)	Motors and generators (SIC 3621)	Carbon and graphite products (SIC 3624)	Relays and industrial controls (SIC 3625)	Electrical industrial apparatus, n.e.c. (SIC 3629)
Gross book value of depreciable assets:						
Total:						
Beginning of year	1 033.5	1 264.7	2 535.3	972.3	1 767.1	260.1
New capital expenditures ¹	66.0	120.5	201.6	47.3	165.5	31.9
Used capital expenditures	3.4	4.1	9.1	3.5	10.7	6.8
Retirements	49.6	64.9	102.5	18.0	69.4	13.3
End of year	1 053.4	1 324.4	2 643.4	1 005.1	1 873.9	285.4
Buildings and other structures:						
Beginning of year	290.0	353.4	528.2	222.8	550.5	61.4
New capital expenditures	9.5	19.9	24.3	5.0	23.2	5.3
Used capital expenditures .....	.4	1.3	3.0	1.2	3.3	2.9
Retirements	9.4	7.9	11.0	.9	10.9	.9
End of year	290.6	366.7	544.5	228.2	566.1	68.7
Machinery and equipment:						
Beginning of year	743.5	911.3	2 007.0	749.5	1 216.6	198.7
New capital expenditures ¹	56.5	100.6	177.3	42.3	142.2	26.6
Used capital expenditures	3.0	2.8	6.1	2.3	7.5	3.9
Retirements	40.2	57.0	91.5	17.2	58.6	12.4
End of year	762.8	957.7	2 098.9	776.9	1 307.8	216.7
Depreciation charges during 1987:						
Total	59.1	92.5	215.6	56.9	148.6	22.4
Buildings and other structures	11.3	13.6	26.1	10.1	22.8	3.6
Machinery and equipment	47.8	78.9	189.5	46.9	125.8	18.8
Rental payments:						
Total	15.4	26.8	39.2	3.3	55.1	9.9
Buildings and other structures	5.1	12.0	12.6	1.2	24.9	5.5
Machinery and equipment	10.4	14.8	26.6	2.1	30.2	4.4

Note: Retirements and depreciation data for establishments not included in the ASM sample were extrapolated from the historical ratio of retirements or depreciation to assets. These ratios were developed at the industry level.

¹Data on new machinery and equipment expenditures by type are provided in table 3c.

Table 3c. Supplemental Industry Statistics Based on Sample Estimates: 1987

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Transformers, except electronic (SIC 3612)		Switchgear and switchboard apparatus (SIC 3613)		Motors and generators (SIC 3621)	
	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)
Purchased services:						
Cost of purchased services for the repair of-						
Buildings and other structures	5.3	(X)	6.1	(X)	9.1	(X)
Response coverage ratio (percent) ²	69.2	(X)	73.3	(X)	75.3	(X)
Machinery	22.3	(X)	20.7	(X)	48.7	(X)
Response coverage ratio (percent) ²	68.7	(X)	73.8	(X)	78.6	(X)
Cost of purchased communication services	7.4	(X)	10.3	(X)	17.4	(X)
Response coverage ratio (percent) ²	66.0	(X)	75.3	(X)	78.8	(X)
New machinery and equipment expenditures	56.5	(X)	100.6	(X)	177.3	(X)
Automobiles, trucks, etc., for highway use .....	.5	4	2.8	55	.7	26
Computers and peripheral data processing equipment	8.3	3	11.2	15	8.5	5
All other	47.7	1	86.7	4	168.1	1
Adjustment ratio ³	1.2	(X)	1.1	(X)	1.0	(X)
Cost of materials, components, parts, etc., used	1 552.4	(X)	1 693.5	(X)	2 760.3	(X)
Materials purchased or transferred from foreign sources ⁴	95.1	3	30.7	12	149.2	8
Materials purchased or transferred from domestic sources	1 457.3	1	1 662.8	1	2 611.1	1
Adjustment ratio ³	1.3	(X)	1.4	(X)	1.4	(X)
Item	Carbon and graphite products (SIC 3624)		Relays and industrial controls (SIC 3625)		Electrical industrial apparatus, n.e.c. (SIC 3629)	
	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)
Purchased services:						
Cost of purchased services for the repair of-						
Buildings and other structures	1.9	(X)	7.3	(X)	1.2	(X)
Response coverage ratio (percent) ²	77.4	(X)	62.4	(X)	66.3	(X)
Machinery	9.8	(X)	16.6	(X)	1.9	(X)
Response coverage ratio (percent) ²	79.1	(X)	64.5	(X)	69.4	(X)
Cost of purchased communication services	3.2	(X)	20.1	(X)	1.7	(X)
Response coverage ratio (percent) ²	77.8	(X)	66.2	(X)	67.5	(X)
New machinery and equipment expenditures	42.3	(X)	142.3	(X)	26.6	(X)
Automobiles, trucks, etc., for highway use	1.3	25	4.9	16	(S)	(S)
Computers and peripheral data processing equipment	2.0	21	36.5	5	(S)	(S)
All other	38.9	2	100.9	2	(S)	(S)
Adjustment ratio ³	1.8	(X)	1.6	(X)	(S)	(X)

See footnotes at end of table.

Table 3c. **Supplemental Industry Statistics Based on Sample Estimates: 1987—Con.**

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Carbon and graphite products (SIC 3624)		Relays and industrial controls (SIC 3625)		Electrical industrial apparatus, n.e.c. (SIC 3629)	
	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)
Cost of materials, components, parts, etc., used.....	444.4	(X)	2 043.5	(X)	446.0	(X)
Materials purchased or transferred from foreign sources ⁴	76.6	5	180.0	6	12.3	8
Materials purchased or transferred from domestic sources.....	367.9	1	1 863.6	1	433.8	1
Adjustment ratio ³	1.5	(X)	1.5	(X)	1.4	(X)

¹For description of relative standard error of estimate, see Qualifications of the Data in appendixes.²Measure of extent to which respondents reported each item. Derived for each item by calculating the ratio of weighted employment for those sample establishments that reported the specific inquiry to total employment for all establishments classified in industry. (See appendixes for explanation of sample weight.)³Detail has been adjusted upwards to account for nonresponse. Inverse of the ratio shown represents a measure of the response to the inquiry. (See appendixes for further explanation.)⁴Data may understate the true cost of imported parts, components, and supplies since some respondents do not know the origin of these materials. Includes cases where materials were purchased from secondary suppliers or where they were transferred from company-operated warehouses or other distribution points. Direct purchases from foreign suppliers and importers by domestic manufacturing establishments are believed to be reported accurately.Table 4. **Industry Statistics by Employment Size of Establishment: 1987**

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E ¹	All estab- lish- ments (no.)	All employees		Production workers			Value added by manufac- ture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expendi- tures (million dollars)	End-of- year invento- ries (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
INDUSTRY 3612, TRANSFORMERS, EXCEPT ELECTRONIC												
Total -----	-	286	32.2	720.4	24.4	46.7	470.5	1 615.4	1 656.4	3 289.5	66.0	479.2
Establishments with an average of—												
1 to 4 employees -----	E9	54	.1	1.9	.1	.2	1.3	4.1	4.1	8.1	.1	1.2
5 to 9 employees -----	E9	31	.2	3.5	.2	.3	2.4	7.2	7.8	15.1	.3	2.1
10 to 19 employees -----	E8	47	.6	12.2	.5	.9	8.0	23.4	24.4	47.6	.9	6.8
20 to 49 employees -----	E5	52	1.6	31.1	1.2	2.3	19.7	63.3	58.6	122.3	2.0	17.9
50 to 99 employees -----	E1	25	1.8	32.1	1.4	2.6	21.1	68.1	62.3	129.9	2.7	20.2
100 to 249 employees -----	-	46	7.8	161.3	5.7	11.7	99.4	349.1	378.9	729.5	14.8	128.3
250 to 499 employees -----	-	11	3.9	91.0	2.9	5.5	58.4	212.5	228.7	446.1	7.7	67.4
500 to 999 employees -----	-	17	12.3	306.2	9.3	16.9	197.6	751.0	749.5	1 506.6	33.6	193.1
1,000 to 2,499 employees -----	-	3	3.7	80.9	3.2	6.3	62.7	136.9	142.1	284.3	3.9	42.2
Covered by administrative records ² -----	E9	129	1.2	19.6	.9	1.8	13.1	39.7	40.5	80.1	1.5	10.9
INDUSTRY 3613, SWITCHGEAR AND SWITCHBOARD APPARATUS												
Total -----	-	474	44.4	1 057.8	29.4	57.1	594.7	2 888.7	1 969.0	4 907.3	120.5	755.1
Establishments with an average of—												
1 to 4 employees -----	E7	100	.2	3.7	.1	.2	2.3	11.4	6.3	17.6	.3	2.4
5 to 9 employees -----	E4	53	.4	7.6	.2	.5	4.6	28.6	19.2	49.0	.5	4.8
10 to 19 employees -----	E6	65	.9	19.7	.6	1.1	11.4	55.6	32.2	88.1	2.0	13.3
20 to 49 employees -----	E2	85	2.8	71.9	1.7	3.3	34.2	176.9	134.1	312.6	4.5	44.8
50 to 99 employees -----	E1	52	3.5	84.7	2.3	4.2	44.5	178.1	187.7	365.2	6.7	57.0
100 to 249 employees -----	-	70	11.1	233.9	7.8	14.9	139.6	625.7	565.8	1 227.4	27.8	236.6
250 to 499 employees -----	-	33	11.7	264.0	7.7	16.0	152.2	777.4	548.2	1 329.1	32.8	192.1
500 to 999 employees -----	-	12	8.3	224.2	5.1	10.1	121.3	665.1	329.2	998.4	26.4	134.3
1,000 to 2,499 employees -----	-	4	5.6	148.0	3.8	6.7	84.7	369.8	146.4	519.9	19.5	69.8
Covered by administrative records ² -----	E9	163	1.2	25.3	.9	1.6	14.8	75.2	37.9	113.1	2.1	16.1
INDUSTRY 3621, MOTORS AND GENERATORS												
Total -----	-	462	74.6	1 663.5	56.5	110.2	1 099.7	3 815.2	2 962.9	6 753.1	201.6	1 130.7
Establishments with an average of—												
1 to 4 employees -----	E8	73	.1	2.7	.1	.2	1.7	6.4	4.9	11.4	.3	1.7
5 to 9 employees -----	E9	42	.3	5.3	.2	.4	3.5	12.2	9.2	21.4	.5	3.2
10 to 19 employees -----	E7	45	.6	12.6	.5	.9	8.2	29.8	24.7	54.5	1.3	8.8
20 to 49 employees -----	E1	71	2.2	46.2	1.5	3.0	25.4	109.9	70.9	180.2	4.5	32.5
50 to 99 employees -----	-	54	4.0	80.0	2.9	5.6	46.3	184.5	172.4	366.5	6.2	59.5
100 to 249 employees -----	-	76	12.6	251.7	9.4	18.5	154.1	567.3	491.8	1 058.3	33.2	199.7
250 to 499 employees -----	-	63	23.3	511.1	17.7	33.9	339.7	1 028.9	883.7	1 913.5	54.0	343.9
500 to 999 employees -----	-	33	22.5	494.1	17.5	34.2	335.6	1 126.6	719.7	1 810.0	59.9	348.4
1,000 to 2,499 employees -----	-	4	9.0	259.8	6.7	13.5	185.1	749.7	585.6	1 337.3	41.6	133.0
2,500 employees or more -----	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ² -----	E9	155	1.2	22.2	.9	1.8	14.5	51.3	37.7	89.0	2.4	13.4

See footnotes at end of table.

Table 4. Industry Statistics by Employment Size of Establishment: 1987—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E ¹	All establishments (no.)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
INDUSTRY 3624, CARBON AND GRAPHITE PRODUCTS												
Total	-	95	9.8	262.7	7.0	14.8	165.9	604.4	613.1	1 224.5	47.3	383.3
Establishments with an average of—												
1 to 4 employees	E8	11	(Z)	.5	(Z)	(Z)	.3	1.1	1.1	2.2	.1	.7
5 to 9 employees	E5	7	.1	1.2	(Z)	.1	.5	2.2	2.7	4.1	.4	2.0
10 to 19 employees	E9	13	.2	4.1	.1	.3	2.6	6.9	7.8	15.1	.4	5.3
20 to 49 employees	E3	24	.8	17.4	.5	1.0	10.0	35.0	30.7	64.1	2.6	19.2
50 to 99 employees	E1	12	.9	19.6	.6	1.2	10.1	50.0	41.3	89.9	3.3	19.0
100 to 249 employees	-	15	2.4	62.5	1.7	3.4	38.1	179.3	125.4	313.5	10.1	92.3
250 to 499 employees	-	7	2.0	58.5	1.5	3.3	38.6	109.8	75.0	183.4	21.5	76.2
500 to 999 employees	-	6	3.5	98.9	2.6	5.6	65.8	220.0	329.2	552.2	9.0	168.7
Covered by administrative records ²	E9	28	.3	6.3	.2	.5	3.9	11.5	12.6	24.1	.7	8.7
INDUSTRY 3625, RELAYS AND INDUSTRIAL CONTROLS												
Total	-	1 168	66.6	1 630.7	37.6	72.7	697.3	3 781.2	2 292.7	6 100.5	165.5	1 277.6
Establishments with an average of—												
1 to 4 employees	E9	314	.7	14.0	.4	.7	6.1	32.0	19.6	51.8	1.3	11.0
5 to 9 employees	E8	223	1.5	33.7	.8	1.6	14.4	76.3	47.8	124.5	2.9	26.2
10 to 19 employees	E5	192	2.7	62.7	1.5	2.9	27.5	139.9	87.6	230.2	4.7	45.8
20 to 49 employees	E2	201	6.3	148.5	3.5	6.8	61.1	300.2	204.7	503.3	9.5	97.5
50 to 99 employees	-	101	7.0	167.9	3.9	7.5	66.1	349.7	242.3	593.9	14.9	112.6
100 to 249 employees	-	77	13.0	299.5	7.6	14.8	129.9	652.8	419.0	1 081.3	22.4	236.9
250 to 499 employees	-	36	12.6	284.2	7.6	14.9	126.9	738.8	455.0	1 198.4	29.5	205.4
500 to 999 employees	-	19	12.6	320.0	7.4	14.6	148.1	726.2	442.4	1 187.5	32.8	219.5
1,000 to 2,499 employees	-	4	10.1	300.3	4.9	8.9	117.3	765.1	374.3	1 129.5	47.5	322.7
2,500 employees or more	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	619	4.0	78.0	2.2	4.1	33.4	177.8	104.7	282.4	7.2	59.5
INDUSTRY 3629, ELECTRICAL INDUSTRIAL APPARATUS, N.E.C.												
Total	E1	481	14.5	325.1	8.9	17.7	159.8	698.4	483.8	1 188.2	31.9	261.6
Establishments with an average of—												
1 to 4 employees	E8	202	.4	7.3	.3	.5	3.8	20.7	10.9	31.6	.5	5.9
5 to 9 employees	E8	105	.7	13.3	.5	.9	6.7	30.1	20.5	50.5	1.0	10.8
10 to 19 employees	E7	68	.9	15.1	.6	1.1	7.9	33.0	21.4	56.1	1.2	11.7
20 to 49 employees	E4	47	1.5	33.3	1.0	1.9	16.9	77.9	45.3	123.2	6.1	27.3
50 to 99 employees	E1	24	1.8	36.9	1.1	2.2	19.3	94.3	61.2	156.8	3.8	29.1
100 to 249 employees	-	22	3.5	73.1	2.2	4.2	35.1	145.6	115.5	259.9	5.3	63.3
250 to 499 employees	-	9	3.3	77.7	1.7	3.6	32.5	159.9	105.4	265.2	6.1	66.3
500 to 999 employees	-	4	2.4	68.5	1.6	3.3	37.5	136.9	103.6	245.0	7.9	47.2
Covered by administrative records ²	E9	330	1.6	24.9	1.0	2.0	13.0	57.6	37.2	94.8	1.8	20.2

Note: For qualifications of data, see footnotes on table 1a-1. Data shown as a (D) are included in underscored figures above.

¹Payroll and sales data for some small single unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other Government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown for those employment-size classes where estimated data based on administrative-record data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Report forms were not mailed to small single unit companies with up to 20 employees (cutoff varied by industry). Payroll and sales data for 1987 were obtained from administrative records supplied by other agencies of the Federal Government. Those data were then used in conjunction with industry averages to estimate the items shown. Data are also included in respective employment-size classes shown.

Table 5a. Industry Statistics by Industry and Primary Product Class Specialization: 1987

[Table presents selected statistics for establishments according to their degree of specialization in products primary to their industry. Measures of plant specialization shown are (1) industry specialization: ratio of primary product shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment; and (2) product class specialization: ratio of largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment. See appendix for method of computing ratios. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry or product class code	Industry or primary product class	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
3612	Transformers, except electronic:										
	All establishments in industry	286	32.2	720.4	24.4	46.7	470.5	1 615.4	1 656.4	3 289.5	66.0
36122	Establishments with this product class primary:										
36123	Power and distribution transformers	51	17.1	434.3	12.2	23.3	270.0	915.5	1 024.9	1 955.5	40.6
	Specialty transformers except fluorescent lamp ballast	24	4.0	68.8	3.4	6.4	49.4	144.6	131.7	280.1	4.7
36124	Fluorescent lamp ballasts	12	4.4	81.9	3.8	6.9	61.0	191.4	182.8	378.2	4.8
36126	Commercial, institutional, and industrial general-purpose transformers	17	2.2	50.9	1.7	3.4	35.0	143.1	122.7	262.2	5.9
36127	Power regulators, boosters, and other transformers	11	1.4	28.6	1.1	2.1	18.1	110.8	78.0	188.3	6.0

See footnotes at end of table.

Table 5a. Industry Statistics by Industry and Primary Product Class Specialization: 1987—
Con.

[Table presents selected statistics for establishments according to their degree of specialization in products primary to their industry. Measures of plant specialization shown are (1) industry specialization: ratio of primary product shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment; and (2) product class specialization: ratio of largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment. See appendix for method of computing ratios. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry or product class code	Industry or primary product class	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
3613	Switchgear and switchboard apparatus:										
	All establishments in industry	474	44.4	1 057.8	29.4	57.1	594.7	2 888.7	1 969.0	4 907.3	120.5
	Establishments with this product class primary:										
36132	Power circuit breakers, all voltages	13	1.6	37.1	.9	2.0	19.5	121.0	137.6	260.7	5.7
36133	Low voltage panelboards and distribution boards	119	15.0	365.4	10.0	20.1	214.0	927.8	873.2	1 804.8	36.3
36134	Fuses and fuse equipment, less than 2300 volts	15	4.9	102.6	3.1	5.9	46.6	277.9	103.5	380.7	13.2
36135	Molded case circuit breakers, 1000 volts or less	18	8.8	205.4	6.3	11.2	123.6	700.8	241.2	978.7	25.4
36136	Duct, including plug-in units, 1000 volts or less	4	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
36139	Switchgear, except ducts and relays	84	10.0	260.7	6.3	12.7	138.7	606.9	478.9	1 094.4	32.7
3621	Motors and generators:										
	All establishments in industry	462	74.6	1 663.5	56.5	110.2	1 099.7	3 815.2	2 962.9	6 753.1	201.6
	Establishments with this product class primary:										
36211	Fractional horsepower motors	126	38.2	800.3	30.6	59.1	566.3	2 029.3	1 423.0	3 442.0	111.3
36212	Integral horsepower motors and generators	57	16.9	411.6	12.4	24.6	265.2	852.5	658.2	1 491.9	43.2
36213	Land transportation motors and generators	4	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
36214	Prime mover generator sets	28	4.8	126.8	2.6	5.0	65.5	255.2	402.5	670.2	16.6
36217	Fractional motor generator sets	8	2.2	52.3	1.5	3.0	32.1	109.3	50.7	154.7	1.5
36218	Integral motor generator sets	12	3.6	72.3	3.1	5.9	56.5	193.4	144.6	330.2	8.4
36219	Parts for motors and generators	50	5.8	138.1	4.0	8.2	76.7	256.2	178.4	439.6	14.3
3624	Carbon and graphite products:										
	All establishments in industry	95	9.8	262.7	7.0	14.8	165.9	604.4	613.1	1 224.5	47.3
	Establishments with this product class primary:										
36241	Electrodes	13	2.6	75.8	1.9	3.8	51.5	236.8	350.4	598.0	7.8
36249	Carbon and graphite products, n.e.c.	43	6.6	171.6	4.6	10.0	104.9	339.5	232.9	568.6	37.7
3625	Relays and industrial controls:										
	All establishments in industry	1 168	66.6	1 630.7	37.6	72.7	697.3	3 781.2	2 292.7	6 100.5	165.5
	Establishments with this product class primary:										
36251	Relays for electronic circuitry, industrial control, overload, and switchgear type	75	13.0	275.2	8.9	17.6	146.6	603.3	269.3	876.9	36.7
36252	Specific purpose industrial controls	183	19.3	527.8	8.4	16.7	177.7	1 187.3	787.3	1 958.0	60.9
36253	General purpose industrial controls	153	25.2	631.7	15.4	29.0	292.5	1 555.5	962.3	2 556.1	49.6
36254	Parts for industrial controls and motor-control accessories	31	1.5	33.4	.9	1.8	14.8	68.2	48.3	115.6	3.6
3629	Electrical industrial apparatus, n.e.c.:										
	All establishments in industry	481	14.5	325.1	8.9	17.7	159.8	698.4	483.8	1 188.2	31.9
	Establishments with this product class primary:										
36291	Capacitors for industrial use	5	1.2	29.3	.8	1.7	19.9	63.8	53.2	117.7	2.8
36292	Rectifying apparatus	56	7.9	181.4	4.9	9.8	85.8	349.1	271.3	624.4	19.7
36293	Electrical equipment for industrial use, n.e.c.	33	2.6	63.3	1.4	2.8	28.1	167.7	86.3	255.6	5.6

Note: For qualifications of data, see footnotes on table 1a-1.

Table 5b. Industry-Product Analysis—Value of Shipments and Primary Product Shipments and Specialization and Coverage Ratios for the Industry: 1987 and Earlier Census Years

[An establishment is assigned to an industry based on shipment values of products representing largest amount considered primary to an industry. Frequently, establishment shipments comprise mixtures of products assigned to an industry (primary), those considered primary to other industries (secondary), and receipts for activities such as merchandising or contract work. Columns A-D show this product pattern for an industry, and column E shows primary product specialization ratio. The extent to which an industry's primary products are shipped by establishments classified in and out of an industry is shown in columns F-H and coverage ratio is shown in column I. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and product group code	Industry and census year	Value of shipments					Value of primary product shipments				
		Total (million dollars)	Primary products (million dollars)	Secondary products (million dollars)	Miscellaneous receipts (million dollars)	Primary product specialization ratio col. B ÷ col. B+C (percent)	Total made in all industries (million dollars)	Made in this industry (million dollars)	Made in other industries (million dollars)	Coverage ratio col. B ÷ col. F (percent)	
		A	B	C	D	E	F	G	H	I	
3612	Transformers, except electronic -----	1987..	3 289.5	3 065.0	150.4	74.1	95	3 136.9	3 065.0	71.9	98
		1982..	2 916.0	2 669.3	178.5	68.2	94	2 772.6	2 669.3	103.3	96
		1977..	2 201.8	2 051.1	109.5	41.2	95	2 117.8	2 051.1	66.7	97
3613	Switchgear and switchboard apparatus -----	1987..	4 907.3	4 271.4	360.9	275.0	92	4 597.6	4 271.4	326.2	93
3621	Motors and generators -----	1987..	6 753.1	6 232.0	350.6	170.5	95	6 982.9	6 232.0	751.0	89
		1982..	6 058.1	5 456.5	336.5	265.2	94	6 724.6	5 456.5	1 268.2	81
		1977..	4 458.7	4 001.6	353.4	103.7	92	4 976.2	4 001.6	974.6	80
3624	Carbon and graphite products -----	1987..	1 224.5	1 094.4	40.6	89.4	96	1 196.2	1 094.4	101.7	91
		1982..	980.4	840.1	54.4	85.8	94	900.9	840.1	60.8	93
		1977..	735.2	619.3	38.4	77.5	94	663.0	619.3	43.7	93

See footnotes at end of table.

Table 5b. Industry-Product Analysis—Value of Shipments and Primary Product Shipments and Specialization and Coverage Ratios for the Industry: 1987 and Earlier Census Years—Con.

[An establishment is assigned to an industry based on shipment values of products representing largest amount considered primary to an industry. Frequently, establishment shipments comprise mixtures of products assigned to an industry (primary), those considered primary to other industries (secondary), and receipts for activities such as merchandising or contract work. Columns A-D show this product pattern for an industry, and column E shows primary product specialization ratio. The extent to which an industry's primary products are shipped by establishments classified in and out of an industry is shown in columns F-H and coverage ratio is shown in column I. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and product group code	Industry and census year	Value of shipments					Value of primary product shipments			
		Total (million dollars)	Primary products (million dollars)	Secondary products (million dollars)	Miscellaneous receipts (million dollars)	Primary product specialization ratio col. B ÷ col. B + C (percent)	Total made in all industries (million dollars)	Made in this industry (million dollars)	Made in other industries (million dollars)	Coverage ratio col. B ÷ col. F (percent)
		A	B	C	D	E	F	G	H	I
3625	Relays and industrial controls..... 1987..	6 100.5	5 452.1	317.6	330.7	94	6 040.3	5 452.1	588.2	90
3629	Electrical industrial apparatus, n.e.c. 1987..	1 188.2	1 012.9	133.5	41.8	88	1 163.7	1 012.9	150.8	87
		1 111.3	919.5	142.0	49.7	87	1 003.1	919.5	83.5	92
		1977..	692.4	569.2	82.5	87	699.1	569.2	129.9	81

Table 6a-1. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3612- —	TRANSFORMERS, EXCEPT ELECTRONIC						
	Total	(NA)	(X)	3 136.9	(NA)	(X)	2 772.6
36122 —	Power and distribution transformers	(NA)	(X)	1 694.8	53	(X)	1 554.0
	Distribution transformers, liquid-immersed, all voltages, and dry-type electric utility distribution transformers (excluding general purpose):						
36122 02	Overhead type, single-phase, liquid-immersed, 500 kVA and smaller	14	(S)	435.0	(NA)	(*)	(*)
36122 04	Compartmentalized pad-mounted, single-phase, liquid-immersed, 500 kVA and smaller	12	(S)	238.8	(NA)	(*)	(*)
36122 06	Subsurface and subway types, single-phase, liquid-immersed, 500 kVA and smaller	6	(S)	30.9	(NA)	(*)	(*)
36122 14	Three-phase transformers 500 kVA and smaller, liquid-immersed (all voltages), including overhead type, compartmentalized pad-mounted, and subsurface and subway types	13	(S)	211.8	(NA)	(*)	(*)
36122 16	Network transformers, all ratings, excluding network protectors	7	(S)	58.5	(NA)	(*)	(*)
36122 19	Single-phase and three-phase, pad-mounted (dry), 500 kVA and smaller	4	(S)	1.1	(NA)	(*)	(*)
	Small power transformers, single- and three-phase, all voltages:						
36122 21	Compartmentalized pad-mounted and subsurface underground and conventional subway type transformers, self-cooled equivalent ratings of 501 kVA through 2,500 kVA, liquid-immersed	13	(S)	102.4	(NA)	(*)	(*)
36122 23	Conventional transformers and autotransformers, with and without load-tap-changing, primary unit substation transformers and single circuit unit substations 501 through 2,500 kVA, liquid-immersed	12	(S)	344.8	(NA)	(*)	(*)
36122 28	Liquid-immersed conventional transformers and autotransformers, with and without load-tap-changing, primary unit substation transformers and single circuit unit substations 2,501 through 10,000 kVA, liquid and nonliquid	13	(S)	65.1	(NA)	(*)	(*)
36122 29	Dry-type small power transformers, self-cooled equipment ratings of 501 kVA or more, single- and three-phase high voltage 601 volts and larger; conventional transformers, primary unit substation transformers and core and coil units	2	(D)	(*)	(NA)	(*)	(*)
36122 32	Secondary unit substation transformers, liquid-immersed, all kVA ratings (based on self-cooled nameplate rating); single- and three-phase, all high voltages, and low voltages below 1,000 volts; mineral oil and nonlow flammability fluids	9		63.2	(NA)	(*)	(*)
36122 33	Secondary unit substation transformers, dry-type, single- and three-phase all kVA ratings, all high voltages, and low voltages below 1,000 volts; units sold with or without secondary switching equipment, but with a flange or throat for connection to such equipment (for dry-type, also includes core and coil units for ultimate use in secondary unit substations)	8	(S)	35.4	(NA)	(*)	(*)

See footnotes at end of table.

Table 6a-1. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3612--	TRANSFORMERS, EXCEPT ELECTRONIC—Con.						
36122 --	Power and distribution transformers—Con.						
	Large power transformers, liquid-immersed, self-cooled equivalent ratings (based on self-cooled nameplate ratings), 10,001 kVA or more, single- and three-phase, all high and low voltages; conventional transformers and autotransformers, with and without load-tap-changing primary unit substation transformers and regulating transformers:						
	10,001 kVA, OA to 30,000 kVA, OA (50,000 kVA, top FOA):						
36122 37	With load-tap-changing ----- number--	10	418	105.8	(NA)	(⁴)	(⁴)
36122 39	Without load-tap-changing ----- do--	9	288	56.2	(NA)	(⁴)	(⁴)
	30,001 kVA, OA (50,001 kVA, top FOA) to 100,000 kVA, OA (167,000 kVA, top FOA):						
36122 41	With load-tap-changing ----- number--	7	95	39.7	(NA)	(⁴)	(⁴)
36122 42	Without load-tap-changing ----- do--	7	85	38.5	(NA)	(⁴)	(⁴)
	100,001 kVA, OA (167,001 kVA, top FOA) and larger:						
36122 43	With load-tap-changing ----- number--	4	(S)	23.1	(NA)	(⁴)	(⁴)
36122 44	Without load-tap-changing ----- do--	4	(S)	50.7	(NA)	(⁴)	(⁴)
36122 00	Power and distribution transformers (except parts), n.s.k.-----	(NA)	(X)	93.7	(NA)	(⁴)	(⁴)
36123 --	Specialty transformers except fluorescent lamp ballast-----	(NA)	(X)	273.8	(NA)	(X)	⁵ 545.1
36123 01	Open core and coil units, excluding machine tool control transformers and all units end-bell enclosed (250 VA or less)-----	8	(S)	25.6			
36123 02	Machine tool control transformers ----- do--	6	(S)	13.5			
	High intensity discharge lamp transformers, also known as ballasts:						
36123 03	Mercury vapor lamp ----- thousands--	4	(D)	(⁶)			
36123 04	Metal halide lamp ----- do--	4	(D)	(⁶)			
36123 05	High pressure sodium vapor lamp ----- do--	5	(D)	(⁶)	(NA)	(⁴)	(⁴)
	Instrument transformers:						
36123 06	Indoor and outdoor current transformers ----- thousands--	6	(S)	34.6			
36123 07	Indoor and outdoor voltage transformers ----- do--	5	(S)	17.4			
36123 11	All other specialty transformers, including luminous tube transformers and ignition transformers but excluding internal combustion engine ignition ----- do--	11	(S)	⁶ 171.7			
36123 00	Specialty transformers except fluorescent lamp ballast, n.s.k. -----	(NA)	(X)	10.9			
36124 --	Fluorescent lamp ballasts:						
36124 00	Fluorescent lamp ballasts (for additional detail, see Current Industrial Report MQ-36C, Fluorescent Lamp Ballasts)-----	9	(X)	414.5	12	(X)	312.1
36126 --	Commercial, institutional, and industrial general-purpose transformers, all voltages, single- and three-phase, excluding electric utility distribution transformers-----	(NA)	(X)	232.7	(NA)	(X)	(⁵)
36126 01	Single- and three-phase all enclosed general-purpose and buck-boost transformers and open core and coil units, 3 kVA and below, all voltages ----- number--	8	775 497	31.8			
36126 02	Single- and three-phase, 3.01 kVA through 15 kVA, all voltages ----- do--	12	(S)	29.8			
36126 03	Single- and three-phase, 15.01 kVA through 100 kVA, all voltages ----- do--	12	(S)	77.5			
36126 04	Single- and three-phase, 100.01 kVA and above, all voltages ----- do--	13	(S)	55.4	(NA)	(⁴)	(⁴)
36126 05	Voltage regulating transformers, except transmission and distribution voltage regulators ----- do--	6	(S)	27.9			
36126 09	Other general-purpose transformers, including saturable core reactors ----- do--	8	(S)	9.3			
36126 00	Commercial, institutional, and industrial general-purpose transformers, all voltages, single- and three-phase, excluding electric utility distribution transformers, n.s.k.-----	(NA)	(X)	.9			
36127 --	Power regulators, boosters, and other transformers, including parts and accessories for all transformers-----	(NA)	(X)	277.8	37	(X)	243.2
36127 11	Transmission and distribution voltage regulators, single- and three-phase, including induction voltage regulators, and step voltage regulators ----- number--	4	(D)	(⁷)			
36127 31	Reactor and special-purpose transformers, liquid-immersed and dry-type, all voltages and kVA's such as: reactors, furnace transformers, rectifier transformers, locomotive transformers, grounding transformers, ground fault neutralizers, mobile transformers, mobile unit substations, and integral single-circuit unit substations----- do--	14	(S)	⁷ 55.3	(NA)	(NA)	(⁴)
36127 78	Parts, including renewal and repair parts, subassemblies and accessories for all transformers -----	15	(X)	219.8			
36127 00	Power regulators, boosters, and other transformers, including parts and accessories for all transformers, n.s.k. -----	(NA)	(X)	2.8			
36120 --	Transformers, except electronic, n.s.k. -----	(NA)	(X)	243.4	(NA)	(X)	118.2
36120 00	Transformers, except electronic, n.s.k., typically for establishments with 20 employees or more (see note)-----	(NA)	(X)	163.6	(NA)	(X)	85.4
36120 02	Transformers, except electronic, n.s.k., typically for establishments with less than 20 employees (see note)-----	(NA)	(X)	79.7	(NA)	(X)	32.8

See footnotes at end of table.

Table 6a-1. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3613--	SWITCHGEAR AND SWITCHBOARD APPARATUS						
	Total -----	(NA)	(X)	4 597.6	(NA)	(X)	6 263.6
36132 -- 36132 00	Power circuit breakers, all voltages: Power circuit breakers, all voltages (for additional detail, see Current Industrial Report MA-36A, Switchgear, Switchboard Apparatus, Relays, and Industrial Controls) -----	29	(X)	390.3	39	(X)	394.6
36133 -- 36133 00	Low voltage panelboards and distribution boards and other switching and interrupting devices, 1,000 volts or less: Low voltage panelboards and distribution boards and other switching and interrupting devices, 1000 volts or less (for additional detail, see Current Industrial Report MA-36A, Switchgear, Switchboard Apparatus, Relays, and Industrial Controls) -----	113	(X)	1 536.4	170	(X)	1 299.5
36134 -- 36134 00	Fuses and fuse equipment, less than 2300 volts, except power distribution cut-outs: Fuses and fuse equipment, less than 2300 volts, except power distribution cut-outs (for additional detail, see Current Industrial Report MA-36A, Switchgear, Switchboard Apparatus, Relays, and Industrial Controls) -----	22	(X)	359.2	31	(X)	280.6
36135 -- 36135 00	Molded case circuit breakers, 1000 volts or less: Molded case circuit breakers, 1000 volts or less (for additional detail, see Current Industrial Report MA-36A, Switchgear, Switchboard Apparatus, Relays, and Industrial Controls) -----	25	(X)	900.1	28	(X)	711.1
36136 -- 36136 00	Duct, including plug-in units and accessories, 1000 volts or less: Duct, including plug-in units and accessories, 1000 volts or less (for additional detail, see Current Industrial Report MA-36A, Switchgear, Switchboard Apparatus, Relays, and Industrial Controls) -----	17	(X)	131.6	27	(X)	162.5
36139 -- 36139 00	Switchgear, except ducts and relays: Switchgear, except ducts and relays (for additional detail, see Current Industrial Report MA-36A, Switchgear, Switchboard Apparatus, Relays, and Industrial Controls) -----	111	(X)	1 030.1	141	(X)	1 230.5
36130 -- 36130 00	Switchgear and switchboard apparatus, n.s.k. -----	(NA)	(X)	249.9	(NA)	(X)	184.8
	Switchgear and switchboard apparatus, n.s.k., typically for establishments with 20 employees or more (see note) -----	(NA)	(X)	136.3	(NA)	(X)	129.2
36130 02	Switchgear and switchboard apparatus, n.s.k., typically for establishments with less than 20 employees (see note) -----	(NA)	(X)	113.7	(NA)	(X)	55.6
3621--	MOTORS AND GENERATORS						
	Total -----	(NA)	(X)	6 982.9	(NA)	(X)	6 724.6
36211 -- 36211 00	Fractional horsepower motors: Fractional horsepower motors (rated at less than 746 watts) (excluding hermetics) (for additional detail, see Current Industrial Report MA-36H, Motors and Generators) -----	113	(X)	3 479.0	133	(X)	2 518.7
36212 -- 36212 00	Integral horsepower motors and generators, except for land transportation equipment, excluding hermetics: Integral horsepower motors and generators other than for land transportation equipment (rated at 746 watts or more) (excluding hermetics) (for additional detail, see Current Industrial Report MA-36H, Motors and Generators) -----	52	(X)	1 293.5	66	(X)	1 454.2
36213 -- 36213 00	Land transportation motors, generators, and control equipment excluding parts: Land transportation motors, generators, and control equipment excluding parts (for additional detail, see Current Industrial Report MA-36H, Motors and Generators) -----	14	(X)	233.1	24	(X)	460.2
36214 -- 36214 00	Prime mover generator sets, except steam or hydraulic turbine: Prime mover generator sets, except steam or hydraulic turbine (for additional detail, see Current Industrial Report MA-36H, Motors and Generators) -----	42	(X)	787.7	37	(X)	961.5
36217 -- 36217 00	Fractional motor generator sets and other rotating equipment, including hermetics: Fractional motor generator sets and other rotating equipment, including hermetics (for additional detail, see Current Industrial Report MA-36H, Motors and Generators) -----	22	(X)	237.9	33	(X)	264.5
36218 -- 36218 00	Integral motor generator sets and other rotating equipment, including hermetics: Integral motor generator sets and other rotating equipment, including hermetics (for additional detail, see Current Industrial Report MA-36H, Motors and Generators) -----	24	(X)	296.8	29	(X)	379.3

See footnotes at end of table.

Table 6a-1. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3621- --	MOTORS AND GENERATORS—Con.						
36219 --	Parts and supplies for motors, generators, generator sets, and other rotating equipment:						
36219 00	Parts and supplies for motors, generators, generator sets, and other rotating equipment, excluding motors for built-in jobs (for additional detail, see Current Industrial Report MA-36H, Motors and Generators)	107	(X)	535.0	78	(X)	510.6
36210 --	Motors and generators, n.s.k.	(NA)	(X)	119.9	(NA)	(X)	175.6
36210 00	Motors and generators, n.s.k., typically for establishments with 20 employees or more (see note)	(NA)	(X)	27.9	(NA)	(X)	138.4
36210 02	Motors and generators, n.s.k., typically for establishments with less than 20 employees (see note)	(NA)	(X)	92.0	(NA)	(X)	37.2
3624- --	CARBON AND GRAPHITE PRODUCTS						
	Total	(NA)	(X)	1 196.2	(NA)	(X)	900.9
36241 --	Electrodes	(NA)	(X)	551.5	(NA)	(X)	440.5
36241 52	Electrodes for electric furnaces and electrolytic cell use, including paste for self-bake electrodes:						
36241 56	Carbon mil lb.	5	330.6	122.2	5	172.0	92.8
36241 00	Graphite do.	10	(S)	428.5	5	263.9	347.7
	Electrodes, n.s.k.	(NA)	(X)	.9	(NA)	(X)	-
36249 --	All other carbon and graphite products	(NA)	(X)	587.7	(NA)	(X)	433.6
36249 11	Brushes, contacts, and brush plates:						
	Automotive brushes (starter, generator, and alternator), including replacement brushes (automotive and light truck type, 6 to 12 volts, inclusive) and those that are coded (excluding automotive accessory brushes)	5	(X)	43.0	5	(X)	23.6
36249 13	Other fractional horsepower brushes and contacts, including replacement brushes (brushes 1/4 sq in. or less in cross section or 1 1/2 in. long or less, including miniature brushes) and automobile accessory brushes	12	(X)	22.0	9	(X)	13.8
36249 15	Other industrial brushes and contacts (brushes more than 1/4 sq in. in cross section and more than 1 1/2 in. long)	11	(X)	56.7	14	(X)	62.0
36249 17	Brush plates	7	(X)	6.3	5	(X)	4.5
36249 88	Carbon and graphite fibers	8	(X)	152.2	(⁹)	(X)	(⁹)
36249 81	All other carbon and graphite products, except refractories:						
	For electrical uses, including welding products, rods, plates, paste brazing, and soldering tips; illuminating carbons; pile and rheostat resistance discs, plugs, plates, and rods; power tube and rectifier parts and plates or rods; spectroscopic products; battery; electronic graphite; telephone components; resistance elements; etc. (excluding silver or other metal contacts)	10	(X)	87.6	15	(X)	117.2
36249 83	For mechanical uses, including one-piece seals, bushings and bearings, packing rings for steam seal, rotor vanes, and other uses where there is relative motion between two parts (excluding metallic oilless bearings)	19	(X)	79.4	20	(X)	87.2
36249 86	For aerospace uses, including unmachined stock and machined items not included elsewhere	8	(X)	19.9	6	(X)	15.3
36249 94	For all other uses (including chemical, metallurgical, etc.):						
36249 96	Paste	5	(X)	33.5	⁹ 22	(X)	⁹ 104.3
36249 00	Other	12	(X)	84.8	(NA)	(X)	5.8
	All other carbon and graphite products, n.s.k.	(NA)	(X)	2.2	(NA)	(X)	5.8
36240 --	Carbon and graphite products, n.s.k.	(NA)	(X)	56.9	(NA)	(X)	26.8
36240 00	Carbon and graphite products, n.s.k., typically for establishments with 20 employees or more (see note)	(NA)	(X)	33.0	(NA)	(X)	17.2
36240 02	Carbon and graphite products, n.s.k., typically for establishments with less than 20 employees (see note)	(NA)	(X)	24.0	(NA)	(X)	9.6
3625- --	RELAYS AND INDUSTRIAL CONTROLS						
	Total	(NA)	(X)	¹⁰ 6 040.3	(NA)	(X)	(¹⁰)
36251 --	Relays for electronic circuitry, industrial control, overload, and switchgear type:						
36251 00	Relays for electronic circuitry, industrial control, overload, and switchgear type	126	(X)	927.0	(NA)	(X)	¹¹ ¹² 146.8
36252 --	Specific-purpose industrial controls:						
36252 00	Specific-purpose industrial controls (for additional detail, see Current Industrial Report MA-36A, Switchgear, Switchboard Apparatus, Relays, and Industrial Controls)	266	(X)	1 755.0	270	(X)	¹³ 406.7
36253 --	General-purpose industrial controls:						
36253 00	General-purpose industrial controls (for additional detail, see Current Industrial Report MA-36A, Switchgear, Switchboard Apparatus, Relays, and Industrial Controls)	224	(X)	2 368.0	238	(X)	¹⁴ 171.8
36254 --	Parts for industrial controls and motor-control accessories:						
36254 00	Parts for industrial controls and motor-control accessories (for additional detail, see Current Industrial Report MA-36A, Switchgear, Switchboard Apparatus, Relays, and Industrial Controls)	125	(X)	440.9	(NA)	(X)	(¹² ¹⁵)

See footnotes at end of table.

Table 6a-1. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3625- --	RELAYS AND INDUSTRIAL CONTROLS—Con.						
36250 --	Relays and industrial controls, n.s.k.	(NA)	(X)	549.4	(NA)	(X)	(¹⁰)
36250 00	Relays and industrial controls, n.s.k., typically for establishments with 20 employees or more (see note)	(NA)	(X)	268.4	(NA)	(X)	(¹⁰)
36250 02	Relays and industrial controls, n.s.k., typically for establishments with less than 20 employees (see note)	(NA)	(X)	281.0	(NA)	(X)	(¹⁰)
3629- --	ELECTRICAL INDUSTRIAL APPARATUS, N.E.C.						
	Total	(NA)	(X)	1 163.7	(NA)	(X)	1 003.1
36291 --	Capacitors for industrial use (except for electronic circuitry)	(NA)	(X)	136.9	(NA)	(X)	190.0
36291 01	Shunt and series power capacitors, units, and equipment, 1/2 kVA or more, and accessories for power factor correction and other low frequency ac applications	4	(S)	97.5	5	(S)	107.2
	Ac capacitors (except electrolytic):						
36291 03	General purpose, for motors, controls, etc.	4	(S)	35.6	5	(S)	44.5
36291 05	High intensity discharge lighting	1	(S)	3.8	(NA)	(D)	(¹⁶)
36291 09	Other capacitors, except for electronic circuitry	1	(S)		(NA)	(S)	1635.9
36291 00	Capacitors for industrial use, n.s.k.	(NA)	(X)		(NA)	(X)	2.4
36292 --	Rectifying apparatus	(NA)	(X)	581.9	(NA)	(X)	524.8
	Rectifying (power conversion) apparatus (except for electronic circuitry), including all apparatus using semiconductors and/or electron tubes as power conversion means:						
	Semiconductor power conversion apparatus:						
36292 21	Semiconductor battery chargers:						
	Automotive	3	(S)	46.2	8	(S)	40.0
36292 25	Industrial and railroad	9	(S)	51.0	9	(S)	30.6
36292 31	Semiconductor computer supplies	4	(X)	(¹⁷)	4	(X)	(¹⁷)
	Semiconductor high-voltage power supplies in excess of 2 kV (excluding separate associated apparatus such as controls, capacitors, switchgear, etc.):						
36292 41	100 kW or less	16	(X)	120.3	15	(X)	98.0
36292 45	More than 100 kW	9	(X)	63.3	7	(X)	52.4
36292 49	All other ac to dc semiconductor power conversion apparatus	11	(X)	17118.4	18	(X)	1794.6
36292 99	Other rectifying (power conversion) apparatus	18	(X)	151.8	25	(X)	199.8
36292 00	Rectifying apparatus, n.s.k.	(NA)	(X)	31.0	(NA)	(X)	9.4
36293 --	Electrical equipment for industrial use, n.e.c.	(NA)	(X)	259.5	(NA)	(X)	213.0
36293 01	Coil windings, electrical	10	(S)	42.9	12	(X)	27.0
36293 02	Solenoids (except solenoid-actuated regulating valves)	10	(S)	33.3	8	(S)	28.0
36293 03	Surge suppressors	3	(X)	4.6			
36293 04	Cathodic protection equipment	4	(X)	19.7			
36293 05	Electrical discharge equipment	1	(X)	(¹⁸)	41	(X)	153.4
36293 09	Other miscellaneous electrical equipment for industrial use, n.e.c.	25	(X)	16136.4			
36293 00	Electrical equipment for industrial use, n.e.c., n.s.k.	(NA)	(X)	22.6	(NA)	(X)	4.6
36290 --	Electrical industrial apparatus, n.e.c., n.s.k.	(NA)	(X)	185.4	(NA)	(X)	75.3
36290 00	Electrical industrial apparatus, n.e.c., n.s.k. typically for establishments with 20 employees or more (see note)	(NA)	(X)	91.1	(NA)	(X)	33.8
36290 02	Electrical industrial apparatus, n.e.c., n.s.k., typically for establishments with less than 20 employees (see note)	(NA)	(X)	94.3	(NA)	(X)	41.5

Note: In 1987 Census of Manufactures, data for establishments of small single unit companies with up to 20 employees were estimated from administrative-record data rather than data actually collected from respondents. Employment cutoffs used for administrative records for each industry and shipments figures are included in code ending with "002". In both 1987 and 1982 Censuses of Manufactures, products not completely identified on standard forms were coded in appropriate product class (five-digit) followed by "00" or to appropriate product group code (four-digit) followed by "000".

¹Data reported by all producers, not just those with shipments of \$100,000 or more.

²For some establishments, data have been estimated from central unit values which are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: * 10 to 19 percent estimated; ** 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

³For 1987, data for product code 36122 29 have been combined with product code 36122 23 to avoid disclosing data for individual companies.

⁴For 1982, detail product data were collected in Current Industrial Report MA-36G, Transformers. In 1987, these data were collected in the Census of Manufactures.

⁵For 1982, data for product codes 36123 -- and 36126 -- were collected and published as product code 36125 00, Specialty Transformers (Except Fluorescent Lamp Ballasts).

⁶For 1987, data for product codes 36123 03, 36123 04, and 36123 05 were combined with product code 36123 11 to avoid disclosing data for individual companies.

⁷For 1987, data for product code 36127 11 have been combined with product code 36127 31 to avoid disclosing data for individual companies.

⁸For 1982, old Industry 3613 included Product Class 36138, Relays, with a value of shipments of \$497.1 million. In 1987, that product class is included in new Industry 3625, Relays and Industrial Controls.

⁹For 1982, product code 36249 88 was combined with product codes 36249 94 and 36249 96 to avoid disclosing data for individual companies.

¹⁰Industry 3625, Relays and Industrial Controls, is published as a separate industry for the first time in 1987. In 1982, it was part of old Industries 3613, Switchgear and Switchboard Apparatus; 3622, Industrial Controls; and 3679, Electronic Components, N.E.C., and separate data are not available.

¹¹For 1982, data for product code 36251 00 were collected and published under product codes 36138 00 (pt), Relays, and 36794 00, Relays for Electronic Circuitry.

¹²For 1982, data for product code 36254 00 were included with product code 36251 00 because data for motor-control accessories were not available separately.

¹³For 1982, data for product code 36252 00 were collected and published as 36221 00, Specific Purpose Industrial Controls.

¹⁴For 1982, data for product code 36253 00 were collected and published as 36222 00, General Purpose Industrial Controls.

¹⁵For 1982, data for product code 36254 00 were collected and published as 36138 00 (pt) Relays, and 36223 00, Parts for Industrial Controls.

¹⁶For 1982, data for product code 36291 05 were combined with product code 36291 09 to avoid disclosing data for individual companies.

¹⁷For both 1987 and 1982, data for product code 36292 31 were combined with product code 36292 49 to avoid disclosing data for individual companies.

¹⁸For 1987, data for product code 36293 05 were combined with product code 36293 09 to avoid disclosing data for individual companies.

Table 6a-2. Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	MA36A, SWITCHGEAR, SWITCHBOARD APPARATUS, RELAYS, AND INDUSTRIAL CONTROLS				
36132 —	Power circuit breakers, and parts, all voltages	(X)	372.8	(X)	388.3
36132 16	Power circuit breakers (sold separately) for use in metal-clad switchgear (oil and oilless), more than 1,000 volts	2	18.6	(NA)	67.0
36132 17	Parts for power circuit breakers for use in metal-clad switchgear	(X)	14.7		
36132 21	Power circuit breakers, free standing, oil and oilless, from 15.5 kV through 800 kV or more				
36132 22	Parts for power circuit breakers, free standing, oil and oilless, from 15.5 kV through 800 kV or more				
36132 26	Power circuit breakers (sold separately) in individual enclosures and/or for use in low-voltage switchgear, 1,000 volts or less, (excluding molded case circuit breakers)	(NA)	158.9	(NA)	209.4
36132 27	Parts for power circuit breakers in individual enclosures and/or for use in low-voltage switchgear, 1,000 volts or less, (excluding molded case circuit breakers)				
36132 31	All other power circuit breakers (sold separately), oil and oilless, network protectors and automatic circuit reclosers	4 402	164.0	(NA)	111.9
36132 32	Parts for all other power circuit breakers, oil and oilless, network protectors and automatic circuit reclosers	(X)	16.6		
36133 —	Low voltage panelboards, distribution boards, and other switching and interruption devices 1,000 volts or less	(X)	1 569.3	(X)	1 244.2
36133 11	Panelboards, including enclosing cabinets:				
36133 12	Fusible, including combination switch fuse	1 775	120.7	(NA)	96.2
36133 12	Circuit breaker	860	298.1	(NA)	213.5
36133 15	Distribution switchboards:				
36133 15	Fusible	44	102.7	(NA)	91.5
36133 17	Circuit breaker	65	161.9	(NA)	124.5
36133 19	Other, including theater switchboards	55	26.1	(NA)	23.7
36133 21	Switches (except switches commonly known as snap, toggle, and rotary switches; and switch devices intended primarily to be used with electric motor controls):				
36133 21	Knife switches, enclosed:				
36133 22	Heavy duty	1 176	117.8	(NA)	83.0
36133 22	General duty	1 726	59.5	(NA)	40.0
36133 24	Load centers:				
36133 24	Enclosed fusible, service entrance, and branch circuit cutouts	448	4.1	(NA)	7.3
36133 26	Circuit breaker type	8 792	258.2	(NA)	172.8
36133 32	Grouped metering panels (combinations of two meters or more and related switching units with over current protection associated with each meter, including accessory components, excluding single socket load combinations)	637	66.4	(NA)	27.3
36133 33	Other switches, (excluding snap, toggle, push, etc., including open knife switches, motor contact, motor disconnect, meter service equipment other than meter mounting, and test devices)	2 280	117.3	(NA)	94.9
36133 98	Other low voltage switchgear apparatus	17 962	236.6	(NA)	269.6
36134 —	Fuses and fuse equipment, less than 2,300 volts, except power distribution cutouts	(X)	367.6	(X)	274.6
36134 31	Nonrenewable plug fuses	(X)	21.9	(X)	14.8
36134 51	Nonrenewable cartridge fuses	(X)	232.9	(X)	122.7
36134 71	Renewable plug and cartridge fuses, including renewable links	(X)	8.9	(X)	10.2
36134 93	Other fuses and open fuse material, including cutouts, clips, bases, etc.	(X)	103.9	(X)	126.8
36135 —	Molded case circuit breakers, 1,000 volts or less	(X)	879.2	(X)	710.9
36135 14	Industrial type (with or without ground fault detection capability) assembled as complete units in supporting and enclosing housing of insulating materials, with or without accessories or attachments:				
36135 16	With ground fault detection capability	12 502	370.4	(NA)	334.5
36135 16	Without ground fault detection capability				
36135 18	Residential or light duty type (with or without ground fault detection capability as an integral part) primarily for load center application, assembled as complete units in supporting and enclosing housing of insulating materials:				
36135 18	With ground fault detection capability	1 771	27.2	(NA)	216.1
36135 19	Without ground fault detection capability	56 119	286.4		
36135 31	Individually enclosed industrial type, excluding panelboards and busway plugs	803	6.3	(NA)	10.7
36135 91	Other molded case circuit breakers:				
36135 91	Marine and Navy type	59	30.9	(NA)	25.9
36135 92	Aircraft and aerospace	864	74.4		
36135 93	Automotive	(1)	(1)		
36135 94	Electronic	17 774	152.1	(NA)	123.7
36135 95	All other types	8 546	31.6		
36136 —	Duct, including plug-in units and accessories, 1,000 volts or less	913	131.9	(NA)	157.8
36136 11	Busways	913	131.9	(NA)	157.8
36136 31	Trolley-type and lighting distribution duct				
36139 —	Switchgear, except ducts	(X)	1 048.8	(X)	1 212.0
36139 07	Automatic and manual control panels (generators, transformers, feed-controls, etc.)	(X)	162.7	(X)	302.6
36139 09	Metal-clad switchgear (using power circuit breakers, oil and oilless), all voltages 1,000 volts up through 38kV, excluding load interrupter switchgear	(X)	170.2	(X)	287.9
36139 10	Metal-enclosed load interrupter, switchgear assemblies, all voltages, including parts	(X)	82.3	(X)	68.7

See footnotes at end of table.

Table 6a-2. Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982—Con.

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	MA36A, SWITCHGEAR, SWITCHBOARD APPARATUS, RELAYS, AND INDUSTRIAL CONTROLS—Con.				
36139 —	Switchgear, except ducts—Con.				
36139 13	Metal-enclosed low-voltage power circuit breaker switchgear assemblies 1,000 volts or less, including parts and excluding load interrupter switchgear	(X)	125.7	(X)	144.1
36139 17	Metal-enclosed bus bars when sold separately, more than 1,000 volts, including isolated, segregated, nonsegregated and cable bus bars	(X)	29.9	(X)	44.5
	Power switching equipment, including attachments, auxiliaries, bus supports and fittings, and accessories, but excluding power fuses sold separately 2,300 volts or more. Includes single phase circuit reclosers:				
36139 41	Outdoor, excluding structures	(X)	136.4	(X)	180.2
36139 45	Indoor	(X)	2.7	(X)	10.5
36139 51	Power fuses and fuse links for 2,300 volts or more, ac service, excluding distribution cut-outs	(X)	106.6	(X)	32.8
36139 81	Power and ground connectors generally used in substation construction	(X)	(D)	(X)	9.1
36139 91	Overhead transmission and distribution connectors (clamps, taps, terminals, and splices)	(X)	33.0		
36139 93	Transmission and distribution connectors, n.e.c., including underground deadends, hot line taps, stirups, repair sleeves, etc.	(X)	(D)	(X)	88.6
36139 83	Distribution cutouts	(X)	58.7	(X)	43.0
36139 98	Other switchgear devices, including regulators and miscellaneous switchboard devices (for sale separately)	(X)	49.4	(X)	(NA)
36251 —	General purpose and other relays	(X)	888.7	(X)	(NA)
36251 01	Industrial control relays (all voltages), n.e.c. thousands	23 555	249.8	(NA)	(NA)
	General purpose electromechanical relays:				
	More than 100 MW actuating power and sealed (either hermetically or environmentally):				
36251 03	0 through 2.0 amp contact rating	22 921	69.9	(NA)	(NA)
36251 04	More than 2.0 through 10.0 amp contact rating				
36251 05	More than 10.0 amp contact rating	1 977	52.0	(NA)	(NA)
	More than 100 MW actuating power and not sealed:				
36251 06	0 through 2.0 amp contact rating	12 999	46.1	(NA)	(NA)
36251 07	More than 2.0 through 10.0 amp contact rating				
36251 08	More than 10.0 through 25.0 amp contact rating	4 308	15.4	(NA)	(NA)
36251 09	More than 25.0 amp contact rating	653	3.9	(NA)	(NA)
36251 11	0 through 100 MW actuating power (both sealed and not sealed)	2 540	8.7	(NA)	(NA)
	Miniature printed circuit mounted electromechanical relays (excluding reed relays) (profile height 1/2 inch max):				
	Sealed (either hermetically or environmentally):				
36251 12	0 through 2.0 amp contact rating	3 928	6.8	(NA)	(NA)
36251 13	More than 2.0 through 5.0 amp contact rating	90	.4	(NA)	(NA)
36251 14	More than 5.0 amp contact rating	178	.6	(NA)	(NA)
	Not sealed:				
36251 16	0 through 2.0 amp contact rating				
36251 17	More than 2.0 through 5.0 amp contact rating	8 889	14.5	(NA)	(NA)
36251 18	More than 5.0 amp contact rating				
	DIP or SIP footprint:				
36251 19	Sealed (either hermetically or environmentally)	2 713	4.1	(NA)	(NA)
36251 21	Not sealed			(NA)	(NA)
	Telephone relays, all types:				
36251 22	Sealed (either hermetically or environmentally)	601	1.5	(NA)	(NA)
36251 23	Not sealed	100	1.3	(NA)	(NA)
	General purpose solid-state relays:				
	Pure solid-state (excluding time delay):				
36251 24	0 through 2.0 amp switch rating				
36251 25	More than 2.0 through 10.0 amp switch rating	1 616	10.9	(NA)	(NA)
36251 26	More than 10.0 amps switch rating				
	Hybrid solid-state (excluding time delay):				
36251 27	0 through 2.0 amp switch rating				
36251 28	More than 2.0 through 10.0 amp switch rating	88	1.0	(NA)	(NA)
36251 29	More than 10.0 amp switch rating				
	High performance military/aerospace/aircraft relays and contactors (generally pertaining to Mil-R5757, 6106, 19523, 25108, and 39016):				
36251 31	Round and square can multipole airframe relays and contactors (both sealed and not sealed) (all sizes)	(D)	(D)	(NA)	(NA)
	Crystal can types (sealed):				
	Larger than full size	595	23.8	(NA)	(NA)
36251 32	Full size	390	9.0	(NA)	(NA)
36251 33	Half size	1 658	15.4	(NA)	(NA)
36251 35	Smaller than half size (including TO-5 package)	1 267	19.2	(NA)	(NA)
36251 38	RF, antenna, and coaxial relays (sealed and not sealed)				
36251 52	(excluding reed relays)	17	1.4	(NA)	(NA)
	Reed relays:				
	Dry reed:				
36251 59	Miniature size (glass length less than .85 inch)	22 306	34.2	(NA)	(NA)
36251 61	Standard size	10 882	16.8	(NA)	(NA)
	Mercury wetted reed:				
36251 62	Miniature size (glass length less than .85 inch)				
36251 63	Standard size	11 411	35.2	(NA)	(NA)
36251 69	Stepping switches, stepping and impulse relays	(D)	(D)	(NA)	(NA)
	Timing relays (timers):				
36251 79	Solid-state/EMR combination	536	20.0	(NA)	(NA)
36251 81	Solid-state, pure	184	10.7	(NA)	(NA)
36251 82	All other timing relays (timers), including pneumatic, motor driven, electronic, etc.	(X)	25.1	(X)	(NA)
36251 91	All other general purpose and special purpose relays, n.e.c.	(NA)	140.9	(X)	(NA)
36251 96	Parts for general purpose and special purpose relays (sold separately)	(X)	7.4	(X)	(NA)

See footnotes at end of table.

Table 6a-2. Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982—Con.

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	MA36A, SWITCHGEAR, SWITCHBOARD APPARATUS, RELAYS, AND INDUSTRIAL CONTROLS—Con.				
36252 —	Specific purpose industrial controls	(X)	1 731.6	(X)	1 325.8
36252 45	U.S. Coast Guard, Navy, and Marine auxiliary controls and accessories	77	175.9	(NA)	91.0
36252 47	Metal mill control and accessories (all voltages)	do		(NA)	82.3
36252 48	Crane and hoist controls, constant and adjustable voltage, including operators desks and stations	45	25.7	(NA)	29.4
36252 49	Definite purpose contactors and starters (600 volts or less)	8 579	77.6	(NA)	61.9
	Machine tool applications:				
	Controls for numerically controlled machine tools:				
36252 51	Positioning type	53	20.3	(NA)	14.0
36252 55	Continuous path type	6	101.8	(NA)	139.1
36252 59	Digital readout systems, including dial or plug board type	19	19.0	(NA)	35.0
36252 65	Machine tool controls other than numerically controlled machines	16	62.3	(NA)	65.4
36252 71	Programmable controllers (sold separately)	514	600.2	(NA)	366.2
36252 76	Other specific or special purpose ac and dc controllers, other definite purpose devices	2 709	648.7	(NA)	441.5
36253 —	General purpose industrial controls	(X)	2 402.6	(X)	2 083.1
36253 01	Ac full voltage noncombination starters, 1,000 volts or less (excluding controls for packaged adjustable speed drives and synchronous motor starters)	2 343	127.6	(NA)	(NA)
	Ac full voltage combination starters, 1,000 volts or less (excluding controls for packaged adjustable speed drives and synchronous motor starters):				
36253 03	Combination starters, (less pumping panels)	630	112.1	(NA)	(NA)
36253 05	Pumping panels	41	15.6	(NA)	(NA)
36253 07	Ac full voltage manual controllers, 1,000 volts or less	1 641	37.5	(NA)	(NA)
36253 13	Ac contactors, 1,000 volts or less (excluding controls for packaged adjustable speed drives and synchronous motor controls)	967	77.7	(NA)	(NA)
36253 14	Ac reduced voltage controls, 1,000 volts or less (excluding synchronous motor starters)	30	30.3	(NA)	26.1
36253 15	Synchronous motor starters, 1,000 volts or less, (including both full and reduced voltage)	2	1.4	(NA)	1.2
36253 16	Motor control centers, 1,000 volts or less	(X)	243.1	(X)	214.9
36253 18	Starters and contactors for squirrel cage and wound rotor and synchronous and nonsynchronous motors, more than 1,000 through 7,200 volts, air break, vacuum, and oil immersed	6	44.2	(NA)	66.0
36253 21	Brakes and clutches	786	55.4	(NA)	36.8
	Presence sensors and motion measurement devices:				
	Limit switches (positioning sensors):				
36253 32	Electromechanical positioning sensors	(X)	115.8	(X)	84.3
36253 33	Movement sensors	(X)	8.5		
	Solid-state positioning sensors:				
36253 35	Non-optical proximity sensors	(X)	47.7	(X)	(NA)
36253 36	Optical proximity sensors	(X)	35.0	(X)	(NA)
36253 37	All other pilot circuit devices (excluding relays and limit switches)	(X)	69.2	(X)	(NA)
36253 38	Dc power circuit devices (all voltages)	(X)	30.2	(X)	(NA)
36253 39	Other control sensors (all voltages)	(X)	56.2	(X)	(NA)
	Pushbuttons and pushbutton stations but excluding operators' desks and stations:				
36253 42	Pushbuttons, 18 mm and smaller	(X)	5.3		
36253 46	Pushbuttons, 19 mm to 29 mm	(X)	32.1	(X)	163.2
36253 48	Pushbuttons, 30 mm and larger	(X)	170.3		
36253 81	Rheostats and resistors (except for electronic applications) sold separately, n.e.c.	(X)	40.4	(X)	41.5
	Controls for packaged adjustable speed drives (including electronic and nonelectronic and operators' desks and stations):				
36253 83	Controls for ac standard drives	91	115.7		
36253 84	Controls for dc standard drives	376	58.8		
36253 85	Ac drives systems	207	169.6	(NA)	270.4
36253 86	Dc drives systems	180	96.8		
36253 98	Solid-state controllers (all voltages)	1 049	109.4	(NA)	(NA)
36253 99	All other general industry devices and systems	(X)	496.7	(X)	702.9
36254 —	Motor controller accessories and parts for industrial controls	(X)	429.4	(X)	(NA)
36254 91	Motor controller accessories, including those items which are sold separately, but become part of a motor controller. Includes overload relays, auxiliary contacts, heater elements, mechanical interlocks, control transformers, kits to add push buttons, selector switches, pilot lights, separate controller enclosures and enclosure fittings, reset mechanisms, etc. (excluding motor circuit switches sold separately)	(X)	89.8	(X)	(NA)
36254 97	Parts for industrial controls	(X)	339.7	(X)	343.1
	MQ36C, FLUORESCENT LAMP BALLASTS				
36124 —	Fluorescent lamp ballasts	(X)	437.0	(X)	310.6
	Uncorrected power-factor type:				
	Switch start:				
36124 62	20 watt or less	9.2	11.4		18.0
36124 63	21 watt to 40 watt	(2)	(2)	12.4	
36124 65	More than 40 watt	23.6	27.7		
36124 61	Rapid start	5.4	18.1	3.2	11.5
36124 66	Other than rapid and switch start	1.3	5.6	2.0	5.7
	Corrected power-factor type:				
	Stimline and instant start:				
36124 67	Two-lamp 96T12 and 72T12	8.8	79.0	6.4	57.0
36124 68	Other	1.1	11.0	.9	8.8

See footnotes at end of table.

Table 6a-2. Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982—Con.

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	MQ36C, FLUORESCENT LAMP BALLASTS—Con.				
36124 --	Fluorescent lamp ballasts—Con. Corrected power-factor type—Con.				
	Rapid start:				
36124 71	Two-lamp, 40 watt ----- millions--	37.1	199.1	26.9	144.5
	All other rapid start:				
36124 72	800 to 1,000 mA ----- do--	2.6	46.5	1.9	35.1
36124 73	1,500 mA ----- do--	.4	11.3	.4	11.8
36124 74	Other ----- do--	4.3	27.6	2.4	14.8
	Switch start:				
36124 76	Two-lamp, 40 watt ----- millions--	.1	.8	(D)	(D)
36124 81	Other, except 2-lamp, 40 watt ----- do--				
36124 79	All other corrected power-factor type ----- do--	.4	2.9	(D)	(D)
	Electronic type:				
36124 83	Preheat or rapid start lamp up through 40 watt ----- millions--	.7	16.1	(NA)	(NA)
36124 85	Single-pin slimline, instant start lamp ----- do--				
36124 87	Rapid start lamp operating at 800 mA or more ----- do--	-	-	(NA)	(NA)
	MA36H, MOTORS AND GENERATORS				
36211 --	Fractional horsepower (excluding hermetics and other rotating equipment) ----- thousands--	275 452.8	3 493.8	177 824.0	2 503.5
36211 0M	Used in automobile accessories (excluding starter motors and generators) ----- do--	116 601.1	1 090.8	45 390.0	546.2
	Used in aircraft and spacecraft (excluding generators):				
36211 0N	Ac ----- thousands--	337.5	53.9	183.0	36.7
36211 0P	Dc ----- do--	484.0	83.6	199.0	42.8
36211 0R	Used in toys (all sizes, including those for advertising displays, etc.) include ac and dc ----- do--	22 648.0	64.7	13 944.0	40.0
36211 05	Used for clock-type snychronous and subsynchronous timing ----- do--				
	All other uses:				
	Ac (noncommutated) ----- thousands--	113 727.5	1 774.1	(NA)	(NA)
	Single phase:				
	Skeleton type shaded pole:				
	Less than 2.75 inch diameter:				
36211 2A	2 pole ----- thousands--	14 258.2	48.9	(NA)	(NA)
36211 2B	4 pole or more ----- do--	-	-	(NA)	(NA)
	2.75 inch diameter or more:				
36211 2C	2 pole ----- thousands--	20 583.1	77.0	(NA)	(NA)
36211 2D	4 pole ----- do--				
	Conventional type shaded pole:				
	Less than 1.5 inch diameter:				
36211 2E	2 pole ----- thousands--	(D)	(D)	(NA)	(NA)
36211 2F	4 pole ----- do--	(D)	(D)	(NA)	(NA)
	1.5 to less than 2.5 inch diameter:				
36211 2G	2 pole ----- thousands--	(D)	(D)	(NA)	(NA)
36211 2H	4 pole ----- do--	-	-	(NA)	(NA)
	2.5 to less than 3.75 inch diameter:				
36211 2I	2 pole ----- do--	5 530.9	54.8	(NA)	(NA)
36211 2J	4 pole ----- do--	12 590.9	106.9	(NA)	(NA)
36211 2K	6 pole ----- do--	-	-	(NA)	(NA)
	3.75 to less than 4.375 inch diameter:				
36211 2L	2 pole ----- thousands--	(D)	(D)	(NA)	(NA)
36211 2M	4 pole ----- do--	781.3	15.0	(NA)	(NA)
36211 2N	6 pole or more ----- do--	(D)	(D)	(NA)	(NA)
	4.375 to less than 5.375 inch diameter:				
36211 2O	2 pole ----- thousands--	-	-	(NA)	(NA)
36211 2P	4 pole ----- do--	1 082.2	17.8	(NA)	(NA)
36211 2R	6 pole or more ----- do--	3 961.5	27.3	(NA)	(NA)
	5.375 inch diameter or more:				
36211 2S	2 pole ----- thousands--	-	-	(NA)	(NA)
36211 2T	4 pole ----- do--	(D)	(D)	(NA)	(NA)
36211 2U	6 pole or more ----- do--	384.5	9.1	(NA)	(NA)
	Permanent split capacitor:				
	Less than 2.5 inch diameter:				
36211 3A	2 pole ----- thousands--	228.9	5.3	(NA)	(NA)
36211 3B	4 pole ----- do--	(D)	(D)	(NA)	(NA)
36211 3C	6 pole or more ----- do--	-	-	(NA)	(NA)
	2.5 to less than 3.75 inch diameter:				
36211 3D	2 pole ----- thousands--	2 062.0	50.9	(NA)	(NA)
36211 3E	4 pole ----- do--	1 215.9	28.8	(NA)	(NA)
36211 3F	6 pole or more ----- do--	10.6	.2	(NA)	(NA)
	3.75 to less than 4.375 inch diameter:				
36211 3G	2 pole ----- thousands--	(D)	(D)	(NA)	(NA)
36211 3H	4 pole ----- do--	251.0	4.9	(NA)	(NA)
36211 3I	6 pole or more ----- do--	(D)	(D)	(NA)	(NA)
	4.375 to less than 5.375 inch diameter:				
36211 3J	2 pole ----- thousands--	(D)	(D)	(NA)	(NA)
36211 3K	4 pole ----- do--	1 979.8	55.3	(NA)	(NA)
36211 3L	6 pole ----- do--	(D)	(D)	(NA)	(NA)
36211 3M	8 pole or more ----- do--	(D)	(D)	(NA)	(NA)
	5.375 to less than 6 inch diameter:				
36211 3N	2 pole ----- thousands--	35.9	2.5	(NA)	(NA)
36211 3O	4 pole ----- do--	598.8	22.4	(NA)	(NA)
36211 3P	6 pole ----- do--	5 391.6	137.8	(NA)	(NA)
36211 3R	8 pole ----- do--	572.9	13.1	(NA)	(NA)
36211 3S	10 pole or more ----- do--	-	-	(NA)	(NA)
	6 inch diameter or more:				
36211 3T	2 pole ----- thousands--	44.7	5.7	NA	(NA)
36211 3U	4 pole ----- do--	192.9	25.8	(NA)	(NA)
36211 3V	6 pole ----- do--	(D)	(D)	(NA)	(NA)
36211 3W	8 pole ----- do--	7.1	.5	(NA)	(NA)
36211 3X	10 pole or more ----- do--	-	-	(NA)	(NA)
	Synchronous stepper motors:				
36211 4A	Less than 3 inch diameter ----- thousands--	152.7	1.9	(NA)	(NA)
36211 4B	3 to less than 4 inch diameter ----- do--	(D)	(D)	(NA)	(NA)
36211 4C	4 to less than 6 inch diameter ----- do--	(D)	(D)	(NA)	(NA)
36211 4D	6 inch diameter or more ----- do--	(D)	(D)	(NA)	(NA)

See footnotes at end of table.

Table 6a-2. Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982—Con.

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	MA36H, MOTORS AND GENERATORS—Con.				
36211 —	Fractional horsepower (excluding hermetics and other rotating equipment)—Con. All other uses—Con. Ac (noncommutated)—Con. Single phase—Con. All other single phase: Less than 2.5 inch diameter:				
36211 4E	2 pole .....thousands..	(D)	(D)	(NA)	(NA)
36211 4F	4 pole .....do..	(D)	(D)	(NA)	(NA)
36211 4G	6 pole or more .....do..	-	-	(NA)	(NA)
36211 4H	2.5 to less than 3.75 inch diameter:				
36211 4I	2 pole .....thousands..	3 289.4	113.0	(NA)	(NA)
36211 4J	4 pole .....do..	66.7	1.6	(NA)	(NA)
36211 4J	6 pole or more .....do..	(D)	(D)	(NA)	(NA)
36211 4K	3.75 to less than 4.375 inch diameter:				
36211 4L	2 pole .....thousands..	(D)	(D)	(NA)	(NA)
36211 4M	4 pole .....do..	83.9	3.3	(NA)	(NA)
36211 4M	6 pole or more .....do..	-	-	(NA)	(NA)
36211 4N	4.375 to less than 5.375 inch diameter:				
36211 4O	2 pole .....thousands..	193.4	5.7	(NA)	(NA)
36211 4P	4 pole .....do..	77.4	7.5	(NA)	(NA)
36211 4P	6 pole or more .....do..	-	-	(NA)	(NA)
36211 4R	5.375 to less than 6 inch diameter:				
36211 4S	2 pole .....thousands..	3 274.0	94.5	(NA)	(NA)
36211 4T	4 pole .....do..	15 786.6	342.6	(NA)	(NA)
36211 4T	6 pole or more .....do..	1 021.7	31.0	(NA)	(NA)
36211 4U	6 inch diameter or more:				
36211 4V	2 pole .....thousands..	(D)	(D)	(NA)	(NA)
36211 4W	4 pole .....do..	501.9	35.8	(NA)	(NA)
36211 4W	6 pole or more .....do..	(D)	(D)	(NA)	(NA)
	Polyphase (servo and nonservo):				
	Less than 2.0 inch diameter:				
36211 5A	2 pole .....thousands..	(D)	(D)	(NA)	(NA)
36211 5B	4 pole .....do..	-	-	(NA)	(NA)
36211 5C	6 pole or more .....do..	-	-	(NA)	(NA)
36211 5D	2.0 to less than 4.0 inch diameter:				
36211 5E	2 pole .....thousands..	20.6	1.5	(NA)	(NA)
36211 5F	4 pole .....do..	14.2	1.8	(NA)	(NA)
36211 5F	6 pole or more .....do..	(D)	(D)	(NA)	(NA)
36211 5G	4.0 to less than 7.0 inch diameter:				
36211 5H	2 pole .....thousands..	61.4	4.6	(NA)	(NA)
36211 5I	4 pole .....do..	468.7	40.6	(NA)	(NA)
36211 5I	6 pole or more .....do..	72.2	5.4	(NA)	(NA)
36211 5J	7.0 inch diameter or more:				
36211 5K	2 pole .....thousands..	-	-	(NA)	(NA)
36211 5L	4 pole .....do..	(D)	(D)	(NA)	(NA)
36211 5L	6 pole or more .....do..	(D)	(D)	(NA)	(NA)
	By type of commutation:				
	Mechanically commutated (brushes):				
	Universal (ac or dc):				
	Cased or sleeved:				
36211 7A	Less than 2.875 inch diameter .....thousands..	4 287.5	31.8	(NA)	(NA)
36211 7B	2.875 to less than 3.188 inch diameter .....do..	1 454.6	27.9	(NA)	(NA)
36211 7C	3.188 to less than 3.563 inch diameter .....do..	83.9	4.9	(NA)	(NA)
36211 7D	3.563 inch diameter or more .....do..	89.5	5.7	(NA)	(NA)
	Uncased:				
36211 7E	Less than 2.875 inch diameter .....thousands..	3 436.7	23.1	(NA)	(NA)
36211 7F	2.875 to less than 3.188 inch diameter .....do..	(D)	(D)	(NA)	(NA)
36211 7G	3.188 to less than 3.563 inch diameter .....do..	-	-	(NA)	(NA)
36211 7H	3.563 to less than 4.375 inch diameter .....do..	(D)	(D)	(NA)	(NA)
36211 7I	4.375 inch diameter or more .....do..	(D)	(D)	(NA)	(NA)
	Permanent magnet:				
	Servo:				
36211 7J	Less than 2.0 inch diameter .....thousands..	1 850.4	45.1	(NA)	(NA)
36211 7K	2.0 to less than 4.0 inch diameter .....do..	268.7	25.0	(NA)	(NA)
36211 7L	4.0 to less than 7.0 inch diameter .....do..	(D)	(D)	(NA)	(NA)
36211 7M	7.0 inch diameter or more .....do..	(D)	(D)	(NA)	(NA)
	Nonservo:				
36211 7N	Less than 2.0 inch diameter .....thousands..	4 167.8	32.0	(NA)	(NA)
36211 7O	2.0 to less than 4.0 inch diameter .....do..	2 328.3	78.7	(NA)	(NA)
36211 7P	4.0 to less than 7.0 inch diameter .....do..	158.9	23.1	(NA)	(NA)
36211 7R	7.0 inch diameter or more .....do..	-	-	(NA)	(NA)
	Wound field (servo and nonservo):				
36211 7S	Less than 2.0 inch diameter .....thousands..	-	-	(NA)	(NA)
36211 7T	2.0 to less than 4.0 inch diameter .....do..	825.5	12.7	(NA)	(NA)
36211 7U	4.0 to less than 7.0 inch diameter .....do..	58.6	8.5	(NA)	(NA)
36211 7V	7.0 inch diameter or more .....do..	-	-	(NA)	(NA)
	Electronically commutated:				
	Stepper:				
36211 8A	Less than 3 inch diameter .....thousands..	702.4	24.9	(NA)	(NA)
36211 8B	3 to less than 4 inch diameter .....do..	7.1	1.0	(NA)	(NA)
36211 8C	4 to less than 6 inch diameter .....do..	-	-	(NA)	(NA)
36211 8D	6 inch diameter or more .....do..	-	-	(NA)	(NA)
36211 8E	Other (servo and nonservo) .....do..	18.4	3.0	(NA)	(NA)
36211 XX	Not specified by type of commutation.....do..	786.7	11.9	(NA)	(NA)
36212 —	Integral horsepower (excluding hermetics and other rotating equipment).....thousands..	6 785.4	1 249.7	3 544.6	1 409.8
36212 04	Used in aircraft and spacecraft (except generators) .....do..	15.6	26.6	5.0	6.4

See footnotes at end of table.

Table 6a-2. Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982—Con.

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	MA36H, MOTORS AND GENERATORS—Con.				
36212 —	Integral horsepower (excluding hermetics and other rotating equipment)—Con.				
	All other uses:				
	Ac (noncommutated):				
	Motors:				
36212 10	Single phase thousands..	1 441.4	156.7	(NA)	(NA)
36212 2X	Polyphase (multiphase) induction (except synchronous):				
	Servo:				
36212 21	Less than 2 inch diameter thousands..	1 630.7	704.2	(NA)	(NA)
36212 22	2 to less than 4 inch diameter do..				
36212 23	4 to less than 7 inch diameter do..				
36212 24	7 inch diameter or more do..				
36212 26	Nonservo do..				
36212 55	Synchronous (servo and nonservo) do..	1.4	20.8	(NA)	(NA)
	Generators:				
36212 51	746 watts to less than 1.5 kW thousands..	(D)	(D)	(NA)	(NA)
36212 52	1.5 kW to less than 5 kW do..	21.0	16.0	(NA)	(NA)
36212 53	5 kW to less than 15 kW do..	5.2	10.2	(NA)	(NA)
36212 54	15 kW to less than 50 kW do..	4.8	29.9	(NA)	(NA)
36212 55	50 kW to less than 100 kW do..	1.4	9.3	(NA)	(NA)
36212 56	100 kW to less than 200 kW do..	2.3	9.7	(NA)	(NA)
36212 57	200 kW to less than 400 kW do..	3.1	13.9	(NA)	(NA)
36212 58	400 kW to less than 1,000 kW do..	1.0	13.0	(NA)	(NA)
36212 59	1,000 kW or more do..	(D)	(D)	(NA)	(NA)
	Dc (excluding all arc welding generators, and battery charging generators for internal combustion engines):				
	Motors and generators:				
	Mechanically commutated (brushes):				
36212 6A	Universal (ac or dc and cased or uncased) thousands..	3 369.2	129.6	(NA)	(NA)
	Permanent magnet field (servo and nonservo):				
36212 6C	Less than 2 inch diameter thousands..	(D)	(D)	(NA)	(NA)
36212 6D	2 to less than 4 inch diameter do..	-	-	(NA)	(NA)
36212 6E	4 to less than 7 inch diameter do..	24.3	12.3	(NA)	(NA)
36212 6F	7 inch diameter or more do..	(D)	(D)	(NA)	(NA)
	Wound field (servo and nonservo):				
36212 6H	Less than 2 inch diameter thousands..	(D)	(D)	(NA)	(NA)
36212 6I	2 to less than 4 inch diameter do..	-	-	(NA)	(NA)
36212 6J	4 to less than 7 inch diameter do..	(D)	(D)	(NA)	(NA)
36212 6K	7 inch diameter or more do..	19.9	12.2	(NA)	(NA)
36212 6M	Other do..	-	-	(NA)	(NA)
	Electronically (electrically) commutated:				
36212 7A	Stepper thousands..	-	-	(NA)	(NA)
	Other (servo and nonservo):				
36212 81	Less than 2 inch diameter thousands..	-	-	(NA)	(NA)
36212 82	2 to less than 4 inch diameter do..	-	-	(NA)	(NA)
36212 83	4 to less than 7 inch diameter do..	-	-	(NA)	(NA)
36212 84	7 inch diameter or more do..	3.1	15.9	(NA)	(NA)
36213 —	Motors and generators for land transportation (including those used in associated control equipment) thousands..	705.3	228.6	(NA)	428.3
36213 01	Used for trolley cars, trolley coaches, rapid transit cars, trolley locomotives, third-rail locomotives, multiple unit cars for railway service, and mining locomotives do..	14.6	57.5	(NA)	(NA)
36213 21	Used for gasoline-electric and diesel-electric buses, trucks, locomotives, and rail cars do..	288.5	97.3	(NA)	(NA)
36213 41	All other types of land transportation do..	402.2	73.8	(NA)	(NA)
36214 —	Prime mover generator sets, except steam (or hydraulic) turbine and electric motor driven do..	3240.8	3779.4	171.4	951.8
	Gas and/or gasoline engine-driven generator sets, ac and dc output:				
36214 03	Less than 1.5 kW thousands..	152.5	97.9	(NA)	(NA)
36214 04	1.5 to less than 5 kW do..				
36214 05	5 to less than 15 kW do..				
36214 07	15 to less than 50 kW do..				
36214 08	50 to less than 100 kW do..	2.2	30.4	(NA)	(NA)
36214 09	100 kW or more do..	.3	15.4	(NA)	(NA)
	Diesel engine-driven generator sets, ac and dc output:				
36214 41	Less than 15 kW thousands..	9.4	45.2	(NA)	(NA)
36214 42	15 to less than 50 kW do..	9.9	58.8	(NA)	(NA)
36214 43	50 to less than 100 kW do..	3.1	39.2	(NA)	(NA)
36214 44	100 to less than 200 kW do..	4.0	57.5	(NA)	(NA)
36214 45	200 to less than 400 kW do..	3.3	75.7	(NA)	(NA)
36214 46	400 to less than 600 kW do..	1.2	37.1	(NA)	(NA)
36214 47	600 to less than 800 kW do..	.6	36.2	(NA)	(NA)
36214 48	800 to less than 1,000 kW do..	.5	52.8	(NA)	(NA)
36214 49	1,000 to less than 2,000 kW do..	.7	62.6	(NA)	(NA)
36214 50	2,000 to less than 3,000 kW do..				
36214 51	3,000 kW or more do..				
	Dual fuel (oil and gas) engine-driven generator sets, ac and dc output:				
36214 52	Less than 2,000 kW thousands..	41.4	467.6	.2	52.0
36214 53	2,000 kW or more do..				
36214 75	Other generator set units (including wind-driven but excluding electric motor-driven generator sets) do..	(*)	(*)	-	-
	Electric motor-driven generator sets, other rotating equipment, and parts for motors and generators:				
	Electric motor-driven generator sets (including synamotors converters, inverters, and frequency changers):				
36218 11	Synchronous converters and thousandsable current generators 746 watts or more thousands..	2.4	14.4	(NA)	(NA)
	Other motor generator sets:				
36217 21	Ac and dc output rated at less than 746 watts thousands..	22.8	9.5	(NA)	(NA)
	Ac and dc output rated at 746 watts or more:				
	Ac output, based on the rating of the largest ac generator:				
36218 32	746 watts to less than 150 kW thousands..	2.0	24.4	(NA)	(NA)
36218 33	150 kW or more do..	(D)	(D)	(NA)	(NA)

See footnotes at end of table.

Table 6a-2. Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982—Con.

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	MA36H, MOTORS AND GENERATORS—Con.				
	Electric motor-driven generator sets, other rotating equipment, and parts for motors and generators—Con.				
	Electric motor-driven generator sets (including synamotors converters, inverters, and frequency changers)—Con.				
	Other motor generator sets—Con.				
	Ac and dc output rated at 746 watts or more—Con.				
	Dc output, based on the rating of the largest dc generator:				
36218 34	746 watts to less than 170 kW.....thousands..	1.1	7.5	(NA)	(NA)
36218 36	170 kW or more.....do..	(D)	(D)	(NA)	(NA)
	Other rotating equipment:				
36217 53	Rate generators, resolvers, and combinations (less than 746 watts).....	(X)	84.0	(X)	(NA)
36217 57	Synchro-type components, less than 746 watts.....				
	All hermetic motors:				
36217 97	5.5 inch stator core diameter and smaller.....thousands..	8 087.8	124.2	(NA)	(NA)
36218 97	More than 5.5 inch stator core diameter.....do..	7 633.3	222.3	(NA)	(NA)
	All other rotating equipment:				
36217 98	Rated at less than 746 watts.....	(X)	31.1	(X)	(NA)
36218 98	Rated at 746 watts or more.....	(X)	6.1	(X)	(NA)
	Parts for motors and generators regardless of output rating:				
36219 59	For use in land transportation equipment.....	(X)	25.1	(X)	(NA)
36219 90	Commutators.....	(X)	132.6	(X)	(NA)
36219 95	All other parts.....	(X)	365.9	(X)	(NA)

¹For 1987, data for product code 36135 93 are combined with product code 36135 94 to avoid disclosing data for individual companies.

²For 1987, data for product code 36124 63 are combined with product code 36124 65 to avoid disclosing data for individual companies.

³Product code 36214 includes figures from known distributors who assemble generator sets.

⁴Data for dual fuel generator sets (2,000 kW or more) include figures for other generator set units.

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1987 and 1982

[Million dollars. Product classes covered are those that are economically significant and whose production is geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by type" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1987. For meaning of abbreviations and symbols, see introductory text. For comparability of product classes and product codes between 1982 and 1987 and explanation of terms, see appendices]

Product class and geographic area	1987 value of product shipments	1982 value of product shipments	Product class and geographic area	1987 value of product shipments	1982 value of product shipments
36122, POWER AND DISTRIBUTION TRANSFORMERS			36132, POWER CIRCUIT BREAKERS, ALL VOLTAGES		
United States	1 694.8	1 554.0	United States	390.3	394.6
California	87.9	109.2	Florida	9.0	(NA)
Mississippi	147.4	74.7	New York	2.0	9.6
New York	17.2	15.9	Pennsylvania	86.6	(NA)
Virginia	126.7	95.8			
36123, SPECIALTY TRANSFORMERS EXCEPT FLUORESCENT LAMP BALLAST			36133, LOW VOLTAGE PANELBOARDS AND DISTRIBUTION BOARDS		
United States	273.8	¹ 545.1	United States	1 536.4	1 299.5
California	8.3	(NA)	California	186.7	189.5
Illinois	11.8	(NA)	Colorado	3.6	10.3
Wisconsin	81.8	(NA)	Connecticut	39.6	(NA)
36124, FLUORESCENT LAMP BALLASTS			Florida	6.6	(NA)
United States	414.5	312.1	Georgia	132.4	(NA)
Illinois	82.6	135.7	Illinois	99.2	62.4
36126, COMMERCIAL, INSTITUTIONAL, AND INDUSTRIAL GENERAL-PURPOSE TRANSFORMERS			Massachusetts	34.6	11.1
United States	232.7	(¹)	Michigan	33.0	35.5
California	12.6	(NA)	Missouri	27.0	35.2
New Jersey	4.1	(NA)	New Jersey	38.9	42.3
36127, POWER REGULATORS, BOOSTERS, AND OTHER TRANSFORMERS			New York	36.3	50.2
United States	277.8	243.2	Ohio	101.2	76.0
Ohio	26.4	24.2	Pennsylvania	31.6	30.2
			Texas	90.6	79.1
			36135, MOLDED CASE CIRCUIT BREAKERS, 1000 VOLTS OR LESS		
			United States	900.1	711.1
			Kentucky	5.4	(NA)

See footnotes at end of table.

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1987 and 1982—Con.

[Million dollars. Product classes covered are those that are economically significant and whose production is geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by type" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1987. For meaning of abbreviations and symbols, see introductory text. For comparability of product classes and product codes between 1982 and 1987 and explanation of terms, see appendixes]

Product class and geographic area	1987 value of product shipments	1982 value of product shipments	Product class and geographic area	1987 value of product shipments	1982 value of product shipments
36139, SWITCHGEAR, EXCEPT DUCTS AND RELAYS			36219, PARTS FOR MOTORS AND GENERATORS		
United States	1 030.1	1 230.5	United States	535.0	510.6
California	62.9	74.3	Arkansas	29.4	52.6
Colorado	5.7	(NA)	California	31.8	32.4
Florida	44.9	(NA)	Connecticut	31.6	(NA)
Illinois	213.5	187.5	Illinois	55.1	(NA)
Louisiana	16.2	(NA)	Indiana	14.0	4.8
Michigan	7.0	(NA)	Michigan	39.1	15.3
Missouri	71.7	46.2	Minnesota	45.2	(NA)
New Jersey	55.6	48.4	Mississippi	27.8	(NA)
New York	35.7	42.4	New Jersey	6.2	4.0
Ohio	43.3	39.4	New York	15.1	33.9
Pennsylvania	15.2	190.6	North Carolina	5.0	(NA)
Texas	25.3	(NA)	Ohio	96.6	60.5
West Virginia	4.6	(NA)	Pennsylvania	39.8	33.1
			Wisconsin	26.8	(NA)
36211, FRACTIONAL HORSEPOWER MOTORS			36249, CARBON AND GRAPHITE PRODUCTS, N.E.C.		
United States	3 479.0	2 518.7	United States	587.7	433.6
Arkansas	439.0	280.3	California	35.8	15.5
California	44.8	44.5	New York	25.1	29.2
Connecticut	62.3	57.7	Ohio	49.8	55.5
Illinois	220.1	192.3	Pennsylvania	140.3	117.7
Indiana	265.1	264.2			
Michigan	184.3	99.4	36251, RELAYS FOR ELECTRONIC CIRCUITRY, INDUSTRIAL CONTROL, OVERLOAD, AND SWITCHGEAR TYPE		
Mississippi	162.7	63.1	United States	927.0	²¹ 146.8
Missouri	340.7	244.1	California	158.6	(NA)
New Jersey	22.1	23.8	Connecticut	43.5	(NA)
North Carolina	124.5	(NA)	Illinois	60.5	(NA)
Ohio	108.1	(NA)	Indiana	88.4	(NA)
Pennsylvania	97.1	(NA)	Iowa	6.4	(NA)
Virginia	71.6	52.1	Massachusetts	29.2	(NA)
Wisconsin	184.6	(NA)	Michigan	14.0	(NA)
			New Jersey	45.4	(NA)
36212, INTEGRAL HORSEPOWER MOTORS AND GENERATORS			New York	52.4	(NA)
United States	1 293.5	1 454.2	North Carolina	37.3	(NA)
Arkansas	129.4	154.1	Ohio	44.2	(NA)
California	30.0	55.1	Pennsylvania	61.0	(NA)
Michigan	4.6	(NA)	Texas	10.1	(NA)
New Jersey	18.4	20.6	Wisconsin	60.2	(NA)
North Carolina	54.8	(NA)			
Ohio	264.4	266.0	36252, SPECIFIC PURPOSE INDUSTRIAL CONTROLS		
Oklahoma	19.0	(NA)	United States	1 755.0	1 406.7
Wisconsin	172.4	153.3	California	69.3	66.3
			Colorado	9.7	10.5
36214, PRIME MOVER GENERATOR SETS			Connecticut	38.6	14.0
United States	787.7	961.5	Florida	91.9	47.4
California	22.5	48.8	Illinois	57.5	58.6
Indiana	95.4	(NA)	Indiana	9.5	20.0
Ohio	28.7	(NA)	Massachusetts	194.9	151.6
Wisconsin	124.1	73.2	Michigan	44.9	98.1
			Minnesota	15.1	22.1
36217, FRACTIONAL MOTOR GENERATOR SETS			New Jersey	19.9	23.0
United States	237.9	264.5	New York	60.7	46.7
California	4.7	18.4	North Carolina	67.4	22.9
Connecticut	3.4	(NA)	Ohio	333.8	225.6
Kentucky	27.4	(NA)	Pennsylvania	119.2	129.9
Tennessee	43.7	44.0	South Carolina	15.2	14.2
			Texas	31.8	49.8
36218, INTEGRAL MOTOR GENERATOR SETS			Washington	3.6	(NA)
United States	296.8	379.3	Wisconsin	116.9	124.0
Kentucky	147.4	99.2	36253, GENERAL PURPOSE INDUSTRIAL CONTROLS		
Ohio	21.6	31.1	United States	2 368.0	2 171.8
Tennessee	63.1	42.7	Alabama	7.9	8.6
			California	195.8	227.3
			Connecticut	67.6	51.7
			Florida	42.1	29.0
			Georgia	31.3	(NA)
			Illinois	230.9	232.2
			Indiana	83.2	64.8
			Massachusetts	21.2	16.4
			Michigan	41.3	40.5
			Minnesota	42.4	5.0

See footnotes at end of table.

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1987 and 1982—Con.

[Million dollars. Product classes covered are those that are economically significant and whose production is geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by type" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1987. For meaning of abbreviations and symbols, see introductory text. For comparability of product classes and product codes between 1982 and 1987 and explanation of terms, see appendixes]

Product class and geographic area	1987 value of product shipments	1982 value of product shipments	Product class and geographic area	1987 value of product shipments	1982 value of product shipments
36253, GENERAL PURPOSE INDUSTRIAL CONTROLS—Con.			36254, PARTS FOR INDUSTRIAL CONTROLS AND MOTOR-CONTROL ACCESSORIES—Con.		
New Hampshire.....	34.4	(NA)	Ohio.....	54.4	(NA)
New Jersey.....	55.2	52.2	Pennsylvania.....	13.1	(NA)
New York.....	64.9	79.0	Texas.....	4.3	(NA)
North Carolina.....	355.0	273.5	Wisconsin.....	57.9	(NA)
Ohio.....	171.7	95.3			
Oklahoma.....	9.9	(NA)	36292, RECTIFYING APPARATUS		
Pennsylvania.....	115.3	83.0	United States.....	581.9	524.8
South Carolina.....	56.9	(NA)	California.....	126.2	132.9
Texas.....	61.5	87.6	Illinois.....	61.9	62.6
Wisconsin.....	466.9	374.2	Massachusetts.....	4.0	3.7
			New York.....	53.9	(NA)
			Ohio.....	69.3	(NA)
36254, PARTS FOR INDUSTRIAL CONTROLS AND MOTOR-CONTROL ACCESSORIES			36293, ELECTRICAL EQUIPMENT FOR INDUSTRIAL USE, N.E.C.		
United States.....	440.9	(²)	United States.....	259.5	213.0
California.....	22.0	(NA)	California.....	17.7	15.6
Connecticut.....	12.0	(NA)	Connecticut.....	2.1	5.2
Florida.....	4.1	(NA)	Illinois.....	16.7	(NA)
Illinois.....	37.1	(NA)	Indiana.....	34.0	24.4
Michigan.....	8.9	(NA)	Ohio.....	54.1	(NA)
Minnesota.....	3.5	(NA)	Pennsylvania.....	5.9	10.2
New Jersey.....	7.2	(NA)	Texas.....	15.4	(NA)
New York.....	36.5	(NA)			
North Carolina.....	37.3	(NA)			

¹For 1982, data for product class 36126 were included with product class 36123.
²For 1982, data for product class 36254 were included with product class 36251.

Table 6c. Historical Statistics for Product Classes—Value Shipped by All Producers: 1987 and Earlier Years

[Million dollars. For meaning of abbreviations and symbols, see introductory text. For comparability of product classes and product codes between 1982 and 1987 and explanation of terms, see appendixes]

1987 product code	Product class	1987	1986 ¹	1985 ¹	1984 ¹	1983 ¹	1982	1977	1972
3612-	Transformers	3 136.9	3 071.0	3 045.0	2 964.5	2 806.8	2 772.6	2 117.8	1 436.1
36122	Power and distribution transformers.....	1 694.8	1 798.8	1 816.6	1 724.6	1 534.1	1 554.0	1 320.9	913.9
36123	Specialty transformers except fluorescent lamp ballast.....	273.8	² 633.2	² 586.0	² 562.6	² 482.4	² 545.1	² 342.8	² 225.3
36124	Fluorescent lamp ballasts.....	414.5	408.6	407.9	397.8	345.0	312.1	210.7	160.6
36126	Commercial, institutional, and industrial general-purpose transformers.....	232.7	(²)	(²)	(²)	(²)	(²)	(²)	(²)
36127	Power regulators, boosters, and other transformers.....	277.8	164.0	189.2	206.6	318.3	243.2	168.1	111.4
36120	Transformers, n.s.k.....	243.4	66.4	45.3	72.9	127.1	118.2	75.3	24.9
3613-	Switchgear and switchboard apparatus	4 597.6	4 891.4	4 949.5	4 994.2	4 349.7	4 263.6	(NA)	(NA)
36132	Power circuit breakers, all voltages.....	390.3	370.0	417.3	437.3	407.0	394.6	261.2	182.7
36133	Low voltage panelboards and distribution boards.....	1 536.4	1 828.9	1 788.8	1 787.0	1 408.3	1 299.5	878.2	539.0
36134	Fuses and fuse equipment, less than 2300 volts.....	359.2	351.1	350.7	365.0	361.1	280.6	201.6	99.7
36135	Molded case circuit breakers, 1000 volts or less.....	900.1	918.5	960.9	1 001.0	815.7	711.1	492.0	283.0
36136	Duct, including plug-in units, 1000 volts or less.....	131.6	142.6	153.1	132.0	135.3	162.5	88.5	65.7
36139	Switchgear, except ducts and relays.....	1 030.1	1 079.3	1 087.9	1 098.7	1 012.3	1 230.5	(NA)	(NA)
36130	Switchgear and switchboard apparatus, n.s.k.....	249.9	201.0	190.8	173.2	210.0	184.8	179.3	68.2
3621-	Motors and generators	6 982.9	7 091.0	7 127.1	7 177.0	6 259.1	6 724.6	4 976.2	2 635.7
36211	Fractional horsepower motors.....	3 479.0	3 365.0	3 534.8	3 319.0	2 829.4	2 518.7	1 956.3	1 137.7
36212	Integral horsepower motors and generators.....	1 293.5	1 301.2	1 173.6	1 235.2	1 107.8	1 454.2	1 163.0	567.7
36213	Land transportation motors and generators.....	233.1	365.9	448.6	433.9	309.7	460.2	205.7	106.3
36214	Prime mover generator sets.....	787.7	756.8	723.4	793.8	720.5	961.5	643.9	247.3
36217	Fractional motor generator sets.....	237.9	211.8	283.3	316.2	319.7	264.5	274.5	228.8
36218	Integral motor generator sets.....	296.8	294.8	299.2	341.2	351.4	379.3	288.1	122.9
36219	Parts for motors and generators.....	535.0	702.9	566.9	655.5	418.6	510.6	354.0	188.6
36210	Motors and generators, n.s.k.....	119.9	92.6	92.4	82.3	202.2	175.6	90.7	36.4
3624-	Carbon and graphite products	1 196.2	1 023.3	1 062.1	1 133.4	938.8	900.9	663.0	335.9
36241	Electrodes.....	551.5	521.0	528.1	589.6	465.1	440.5	362.0	136.9
36249	Carbon and graphite products, n.e.c.....	587.7	487.2	515.0	512.9	447.9	433.6	293.1	193.8
36240	Carbon and graphite products, n.s.k.....	56.9	15.1	19.0	30.9	25.8	26.8	7.9	5.2
3625-	Relays and industrial controls	6 040.3	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
36251	Relays for electronic circuitry, industrial control, overload, and switchgear type.....	927.0	³ 1 411.2	³ 1 512.6	³ 1 584.6	³ 1 145.9	³ 1 146.8	(NA)	(NA)
36252	Specific purpose industrial controls.....	1 755.0	1 814.3	1 872.5	1 900.3	1 534.4	1 406.7	(NA)	(NA)
36253	General purpose industrial controls.....	2 368.0	2 322.9	2 268.8	2 412.7	1 906.8	2 171.8	(NA)	(NA)
36254	Parts for industrial controls and motor-control accessories.....	440.9	(³)	(³)	(³)	(³)	(³)	(NA)	(NA)
36250	Relays and industrial controls, n.s.k.....	549.4	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
3629-	Electrical industrial apparatus, n.e.c.	1 163.7	1 133.7	1 179.2	1 123.3	1 031.3	1 003.1	699.1	442.9
36291	Capacitors for industrial use.....	136.9	181.6	209.7	176.0	174.4	190.0	154.8	112.4
36292	Rectifying apparatus.....	581.9	521.0	550.3	539.3	495.3	524.8	310.2	152.6
36293	Electrical equipment for industrial use, n.e.c.....	259.5	294.8	315.8	298.5	279.4	213.0	182.2	145.9
36290	Electrical industrial apparatus, n.e.c., n.s.k.....	185.4	136.4	103.5	109.5	82.3	75.3	51.9	32.0

¹Figures are estimates derived from a representative sample of manufacturing establishments. Standard errors associated with estimates are published in annual survey of manufactures publications for this period.

²Data for product class 36126 were included with product class 36123.

³Data for product class 36254 were included with product class 36251.

Table 7. Materials Consumed by Kind: 1987 and 1982

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3612, TRANSFORMERS, EXCEPT ELECTRONIC				
	Materials, parts, containers, and supplies -----	(X)	1 552.4	(X)	1 330.8
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons..	(S)	7.5	*17.4	9.7
331012	Sheet and strip ----- do..	202.0	104.3	*193.7	110.4
331013	Plates ----- do..	46.8	23.5	*40.2	19.7
331015	Structural shapes ----- do..	(S)	14.4	(S)	54.8
331055	All other carbon steel mill shapes and forms ----- do..	(S)	36.3	59.4	53.8
331020	Alloy steel, except stainless ----- do..	*169.0	244.9	116.5	167.3
331031	Stainless steel mill shapes and forms ----- do..	*4.1	8.5	*3.3	5.2
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb..	(S)	30.7	**157.4	24.2
335008	All other (wire, rolled rod and bar, powder, welded tubing, etc.) ----- do..	*29.2	27.4	(S)	31.3
335770	Magnet wire ----- do..	91.1	121.6	*72.2	95.1
	Copper and copper-base alloy:				
335728	Bare wire (for electrical conduction only) ----- mil lb..	(S)	33.5	72.6	38.7
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes ----- do..	**25.8	25.7	*30.2	19.7
335143	Plate, sheet, and strip, including military cups and discs ----- do..	(S)	14.0	12.8	10.6
335152	Pipe and tube ----- do..	(S)	1.6	(S)	1.4
	Insulated wire and cable, except magnet wire:				
335792	Copper (quantity of copper content) ----- mil lb..	**13.8	22.7	(S)	17.6
335793	Aluminum (quantity of aluminum content) ----- do..	(D)	(9)	(S)	1.9
333401	Aluminum and aluminum-base alloy refinery shapes ----- 1,000 s tons..	(S)	2.8	*.4	1.2
290001	Refined petroleum products (gasoline, jet fuel, lubricating oils and greases, asphalt, etc.) ----- do..	(X)	63.0	(X)	64.5
326400	Porcelain, steatite, and other ceramic electrical products ----- do..	(X)	32.5	(X)	29.1
260003	Paper and paperboard products, except paperboard boxes and containers ----- do..	(X)	48.0	(X)	33.2
285101	Paints, varnishes, lacquers, shellacs, japans, enamels, and allied products ----- 1,000 gal..	(S)	20.8	**1 989.5	12.8
329300	Gaskets (all type) and asbestos packing ----- do..	(X)	3.6	(X)	4.1
329601	Mineral wool insulation (fibrous glass, rock wool, etc.) ----- do..	(X)	5.8	(X)	(9)
345001	Bolts, nuts, screws, rivets, and screw machine products ----- do..	(X)	16.1	(X)	10.0
362001	Electrical industrial capacitors, resistors, rheostats, and coil windings ----- do..	(X)	57.7	(X)	79.3
364300	Current-carrying wiring devices ----- do..	(X)	33.5	(X)	21.0
970099	All other materials and components, parts, containers, and supplies ----- do..	(X)	3394.5	(X)	3330.8
971000	Materials, parts, containers, and supplies, n.s.k. ² ----- do..	(X)	157.8	(X)	83.4
	INDUSTRY 3613, SWITCHGEAR AND SWITCHBOARD APPARATUS				
	Materials, parts, containers, and supplies -----	(X)	*1 693.5	(NA)	(9)
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons..	(S)	16.6	(NA)	(NA)
331012	Sheet and strip ----- do..	(S)	104.4	(NA)	(NA)
331013	Plates ----- do..	(S)	13.5	(NA)	(NA)
331015	Structural shapes ----- do..	(S)	20.2	(NA)	(NA)
331055	All other carbon steel mill shapes and forms ----- do..	(S)	3.9	(NA)	(NA)
331020	Alloy steel, except stainless ----- do..	(D)	(9)	(NA)	(NA)
	Stainless steel:				
331033	Sheet and strip ----- 1,000 s tons..	*1.6	2.6	(NA)	(NA)
331050	All other stainless steel mill shapes and forms ----- do..	(S)	3.5	(NA)	(NA)
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb..	**4.2	5.2	(NA)	(NA)
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ----- do..	**20.1	26.8	(NA)	(NA)
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) ----- do..	**3.6	4.7	(NA)	(NA)
	Copper and copper-base alloy:				
335728	Bare wire (for electrical conduction only) ----- mil lb..	(S)	7.4	(NA)	(NA)
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes ----- do..	**46.0	56.1	(NA)	(NA)
335143	Plate, sheet, and strip, including military cups and discs ----- do..	*17.2	25.1	(NA)	(NA)
335152	Pipe and tube ----- do..	.6	1.0	(NA)	(NA)
335770	Magnet wire ----- do..	**1.2	2.4	(NA)	(NA)
	Insulated wire and cable, except magnet wire:				
335792	Copper (quantity of copper content) ----- mil lb..	(S)	7.6	(NA)	(NA)
335793	Aluminum (quantity of aluminum content) ----- do..	(S)	.4	(NA)	(NA)
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) ----- 1,000 s tons..	(S)	1.5	(NA)	(NA)
332045	Steel ----- do..	(S)	1.7	(NA)	(NA)
336005	Aluminum and aluminum-base alloy ----- mil lb..	(S)	8.8	(NA)	(NA)
336006	Copper and copper-base alloy ----- do..	(S)	6.7	(NA)	(NA)
336008	Other nonferrous, except copper and aluminum ----- do..	(D)	(9)	(NA)	(NA)
	Industrial electrical control equipment (received for incorporation only into other industrial electrical control equipment shipped as such, by same plant):				
362500	Purchased from other companies ----- do..	(X)	88.9	(NA)	(NA)
362501	Received from other plants of same company ----- do..	(X)	142.5	(NA)	(NA)
326400	Porcelain, steatite, and other ceramic electrical products ----- do..	(X)	32.1	(NA)	(NA)
308007	Plastics products consumed in the form of sheets, rods, tubes, and other shapes ----- do..	(X)	58.6	(NA)	(NA)
282104	Plastics resins consumed in the form of granules, pellets, powders, liquids, etc., but excluding sheets, rods, tubes, and shapes ----- mil lb..	(S)	32.7	(NA)	(NA)

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1987 and 1982—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3613, SWITCHGEAR AND SWITCHBOARD APPARATUS—Con.				
333001	Nonferrous metal smelter and refinery shapes, including precious metal----- mil lb..	(S)	30.6	(NA)	(NA)
345001	Bolts, nuts, screws, rivets, and screw machine products -----	(X)	50.1	(NA)	(NA)
361301	Switches, except snap, toggle and push, and circuit breakers -----	(X)	18.3	(NA)	(NA)
362101	Electric motors, generators and parts -----	(X)	10.1	(NA)	(NA)
344401	Sheet metal products, except stampings -----	(X)	21.8	(NA)	(NA)
367002	Resistors, capacitors, transformers, transducers, and other electronic-type components and accessories, except semiconductors -----	(X)	55.8	(NA)	(NA)
970099	All other materials, components, parts, containers, and supplies -----	(X)	² 434.9	(NA)	(NA)
971000	Materials, parts, containers, and supplies, n.s.k. ³ -----	(X)	397.0	(NA)	(NA)
	INDUSTRY 3621, MOTORS AND GENERATORS				
	Materials, parts, containers, and supplies -----	(X)	2 760.3	(X)	2 322.6
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons..	(S)	57.3	^{**} 84.0	53.4
331012	Sheet and strip ----- do..	^{**} 528.3	250.3	575.3	310.1
331013	Plates ----- do..	(S)	7.8	[*] 50.3	25.0
331017	Wire and wire products ----- do..	(S)	17.0	(S)	6.6
331058	All other carbon steel mill shapes and forms ----- do..	154.7	53.1	(S)	25.2
331020	Alloy steel, except stainless ----- do..	(S)	10.8	^{**} 28.3	21.1
331031	Stainless steel ----- do..	(S)	6.8	^{**} 8.1	6.8
	Copper and copper-base alloy:				
335728	Bare wire for electrical conduction only ----- mil lb..	(S)	24.6	(S)	17.3
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes ----- do..	(S)	29.6	^{**} 6.9	11.4
335003	Other ----- do..	(S)	12.7	4.8	8.1
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb..	(S)	17.1	[*] 12.7	8.3
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ----- do..	^{**} 6.0	5.3	[*] 6.7	6.1
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing) ----- do..	(S)	22.7	(S)	10.0
	Primary metals:				
333122	Copper and copper-base alloy refinery shapes ----- 1,000 s tons..	(S)	5.5	1.6	3.1
333401	Aluminum and aluminum-base alloy refinery shapes ----- do..	34.2	40.4	29.2	34.8
335770	Magnet wire ----- mil lb..	^{**} 134.9	191.2	[*] 137.9	213.3
335792	Insulated copper wire and cable, except magnet wire (quantity of copper content) ----- do..	(S)	16.8	(S)	40.9
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) ----- 1,000 s tons..	(S)	58.7	^{**} 73.9	76.2
332045	Steel ----- do..	(S)	5.5	(S)	3.7
336005	Aluminum and aluminum-base alloy ----- mil lb..	(S)	77.0	(S)	49.9
336006	Copper and copper-base alloy ----- do..	(S)	2.8	(S)	5.0
336008	Other nonferrous ----- do..	(S)	19.2	(S)	9.0
346200	Iron and steel forgings ----- 1,000 s tons..	(D)	(⁹)	2.3	4.2
	Engines:				
351920	Diesel and semidiesel ----- thousands..	(S)	65.9	(S)	99.7
351901	Gasoline and other carburetor ----- do..	(S)	38.4	[*] 28.0	17.0
362120	Integral horsepower electric motors and generators (1 hp or more) ----- do..	(S)	12.1	(S)	40.0
	Bearings, including mounted and unmounted:				
356218	Ball -----	(X)	34.5	(X)	47.4
356201	Roller -----	(X)	1.7	(X)	2.9
356810	Plain bearings and bushings -----	(X)	20.3	(X)	11.2
356601	Speed changers, drives, and gears -----	(X)	27.8	(X)	6.3
346901	Metal stampings ----- 1,000 s tons..	(S)	134.4	(S)	74.2
345001	Bolts, nuts, screws, rivets, and screw machine products -----	(X)	53.9	(X)	37.9
367408	Semiconductors ----- millions..	(S)	16.0	(S)	5.8
362491	Carbon brushes -----	(X)	16.3	(X)	8.5
326401	Ceramic magnets (ferrite) -----	(X)	34.7	(X)	15.9
329601	Mineral wool insulation (fibrous glass, rock wool, mica, etc.) -----	(X)	9.5	(X)	6.5
308007	Plastics products consumed in the form of sheets, rod, tubes, and other shapes -----	(X)	77.6	(X)	45.7
282104	Plastics resins consumed in the form of granules, pellets, powders, liquids, etc., but excluding sheets, rods, tubes, and other shapes ----- mil lb..	[*] 21.2	29.6	[*] 11.3	15.7
285101	Paints, varnishes, lacquers, shellacs, japans, enamels, and allied products ----- 1,000 gal..	(S)	23.5	(S)	16.1
362001	Electrical capacitors, resistors, rheostats, and coil windings -----	(X)	53.8	(X)	67.1
360101	Electrical transmission, distribution, and control equipment -----	(X)	42.8	(X)	33.6
306902	Fabricated rubber products, except tires, tubes, hose, belting, and gaskets -----	(X)	7.9	(X)	11.3
265001	Paperboard boxes and containers -----	(X)	47.8	(X)	28.6
970099	All other materials and components, parts, containers, and supplies -----	(X)	³ 581.5	(X)	449.8
971000	Materials, parts, containers, and supplies, n.s.k. ² -----	(X)	498.0	(X)	331.9

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1987 and 1982—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3624, CARBON AND GRAPHITE PRODUCTS				
	Materials, parts, containers, and supplies -----	(X)	444.4	(X)	314.4
335105	Copper and copper-base alloy, mill shapes and forms (except castings and forgings) ----- mil lb..	(S)	4.3	(D)	(⁹)
260001	Paper and paperboard products -----	(X)	1.9	(X)	1.0
286556	Pitch -----	(X)	20.0	(X)	(⁹)
299901	Coke: petroleum coke, metallurgical coke, calcined coke, foundry coke, etc., used as raw material ----- 1,000 s tons..	(S)	55.7	210.3	90.1
329508	Natural graphite ----- do..	8.5	7.9	2.1	2.8
329900	Artificial graphite ----- do..	(X)	(⁹)	(X)	8.1
329500	Carbon, ground or treated ----- do..	(X)	17.9	(X)	23.2
339915	Metal powders ----- mil lb..	(S)	4.0	*3.8	4.0
970099	All other materials and components, parts, containers, and supplies -----	(X)	³ 246.0	(X)	³ 167.9
971000	Materials, parts, containers, and supplies, n.s.k. ² -----	(X)	86.6	(X)	17.3
	INDUSTRY 3625, RELAYS AND INDUSTRIAL CONTROLS				
	Materials, parts, containers, and supplies -----	(X)	⁴ 2 043.5	(NA)	(⁴)
	Mill shapes and forms, except castings and forgings:				
331001	Carbon steel ----- 1,000 s tons..	(S)	54.8	(NA)	(NA)
331020	Alloy steel, except stainless ----- do..	(S)	3.5	(NA)	(NA)
331031	Stainless steel ----- do..	(S)	10.6	(NA)	(NA)
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb..	(S)	4.8	(NA)	(NA)
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ----- do..	(S)	6.6	(NA)	(NA)
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) ----- do..	(S)	1.1	(NA)	(NA)
	Copper and copper-base alloy:				
335728	Bare wire for electrical conduction only ----- mil lb..	(S)	5.8	(NA)	(NA)
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes ----- do..	**12.3	10.4	(NA)	(NA)
335143	Plate, sheet, and strip, including military cups and discs ----- do..	**7.5	10.8	(NA)	(NA)
335152	Pipe and tube ----- do..	(S)	.5	(NA)	(NA)
335791	Insulated wire and cable, except magnet wire ----- do..	(S)	17.2	(NA)	(NA)
335770	Magnet wire ----- do..	(S)	11.0	(NA)	(NA)
	Castings (rough and semifinished):				
332012	Iron (gray and malleable) and steel ----- 1,000 s tons..	(S)	8.4	(NA)	(NA)
336005	Aluminum and aluminum-base alloy ----- mil lb..	(S)	9.1	(NA)	(NA)
336003	Other nonferrous ----- do..	(S)	5.9	(NA)	(NA)
282104	Plastics resins consumed in the form of granules, pellets, powders, liquids, etc., but excluding sheets, rods, tubes, and shapes ----- do..	**12.6	18.0	(NA)	(NA)
345001	Bolts, nuts, screws, rivets, and screw machine products -----	(X)	40.1	(NA)	(NA)
344401	Sheet metal products, except stampings -----	(X)	35.4	(NA)	(NA)
970099	All other materials and components, parts, containers, and supplies -----	(X)	1 309.5	(NA)	(NA)
971000	Materials, parts, containers, and supplies, n.s.k. ² -----	(X)	480.0	(NA)	(NA)
	INDUSTRY 3629, ELECTRICAL INDUSTRIAL APPARATUS, N.E.C.				
	Materials, parts, containers, and supplies -----	(X)	446.0	(X)	403.2
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons..	(S)	.6	(NA)	(⁹)
331012	Sheet and strip ----- do..	(S)	7.1	(NA)	(⁹)
331013	Plates ----- do..	(S)	.4	(NA)	(⁹)
331015	Structural shapes ----- do..	(S)	.8	(NA)	(⁹)
331019	All other carbon steel mill shapes and forms ----- do..	*1.1	1.0	(NA)	(⁹)
331020	Alloy steel, except stainless ----- do..	(D)	(D)	(NA)	(⁹)
	Stainless steel:				
331033	Sheet and strip ----- 1,000 s tons..	(S)	1.6	(NA)	(⁹)
331050	All other stainless steel mill shapes and forms ----- do..	(S)	9.2	(NA)	(⁹)
335770	Magnet wire ----- mil lb..	(S)	9.2	*8.6	14.3
	Copper and copper-base alloy:				
335728	Bare wire for electrical conduction only ----- mil lb..	(S)	1.4	(S)	1.6
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes ----- do..	*4.5	6.2	1.2	1.9
335143	Plate, sheet, and strip, including military cups and discs ----- do..	(S)	2.6	(S)	1.0
335152	Pipe and tube ----- do..	(S)	2.6	(S)	3.3
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb..	2.6	5.0	(X)	-
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ----- do..	(S)	4.1	(S)	1.2
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) ----- do..	(S)	4.1	(S)	3.1
	Insulated wire and cable, except magnet wire:				
335792	Insulated copper wire and cable, except magnet wire (quantity of copper content) ----- mil lb..	(S)	3.7	**4.3	5.2
335793	Aluminum (quantity of aluminum content) ----- do..	(D)	(D)	-	-

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1987 and 1982—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3629, ELECTRICAL INDUSTRIAL APPARATUS, N.E.C.—Con.				
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) ----- 1,000 s tons--	(D)	(D)	(NA)	(⁵)
332045	Steel ----- do--	(D)	(D)	(NA)	(⁵)
336005	Aluminum and aluminum-base alloy ----- mil lb--	(S)	.8	(NA)	(⁵)
336006	Copper and copper-base alloy ----- do--	(D)	(D)	(NA)	(⁵)
336008	Other nonferrous ----- do--	(D)	(D)	(NA)	(⁵)
	Industrial electrical control equipment (received for incorporation only into other industrial electrical control equipment shipped, as such, by this plant):				
362500	Purchased from other companies -----]	(X)	16.1	(NA)	(⁵)
362501	Received from other plants of the same company -----]	(X)	(D)	(NA)	(⁵)
326400	Porcelain, steatite, and other ceramic electrical products -----]	(X)	(D)	(X)	(⁵)
308007	Plastics products consumed in the form of sheets, rods, tubes, and other shapes -----]	(X)	11.3	(NA)	(⁵)
282104	Plastics resins consumed in the form of granules, pellets, powders, liquids, etc., but excluding sheets, rods, tubes, and shapes ----- mil lb--	(S)	1.2	(NA)	(⁵)
333001	Nonferrous metal smelter and refinery shapes, including precious metal ----- do--	(S)	.3	(NA)	(⁵)
345001	Bolts, nuts, screws, rivets, and screw machine products -----	(X)	4.6	(NA)	(⁵)
361301	Switches, except snap, toggle and push, and circuit breakers -----	(X)	2.1	(NA)	(⁵)
362101	Electric motors, generators and parts -----	(X)	1.4	(NA)	(⁵)
344401	Sheet metal products, except stampings -----	(X)	2.8	(NA)	(⁵)
367001	Resistors, capacitors, transformers, transducers, and other electronic-type components, except electron tubes and semiconductors -----	(X)	20.6	(NA)	⁶ 9.6
970099	All other materials and components, parts, containers, and supplies -----	(X)	199.3	(X)	^{3 5} 260.6
971000	Materials, parts, containers, and supplies, n.s.k. ² -----	(X)	132.2	(X)	101.4

¹For some establishments, data have been estimated from central unit values which are based on quantity-cost relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: * 10 to 19 percent estimated; ** 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

²Total cost of materials of establishments that did not report detailed materials data, including establishments that were not mailed a form.

³Data are included with material code 970099 to avoid disclosing data for individual companies.

⁴Industry definition is new for 1987; therefore, 1987 data for materials consumed are not comparable to prior-year data.

⁵For 1982, data for material codes 331011, 331012, 331013, 331015, 331019, 331020, 330133, 331050, 332011, 332045, 336005, 336006, 336008, 362500, 362501, 308007, 282104, 333001, 345001, 361301, 362101, and 344401 were not collected separately but were included with material code 970099.

⁶For 1982, data for material code 367001 included only resistors and capacitors for electronic circuitry. Data for the remainder were included in material code 970099.

APPENDIX A.

Explanation of Terms

This appendix is in two sections. Section 1 includes items requested of all establishments mailed census of manufactures forms including annual survey of manufactures (ASM) forms. Note that this section also includes several items (number of establishments and companies, value added, classes of products, and specialization and coverage ratios) not included on the report forms but derived from information collected on the forms. Section 2 covers supplementary items requested only from establishments included in the ASM sample. Results of the supplementary ASM inquiries are included in table 3c of this report.

SECTION 1. ITEMS COLLECTED OR DERIVED BASED ON ALL CENSUS OF MANUFACTURES (INCLUDING ASM) REPORT FORMS

Number of establishments and companies—As discussed in the Introduction, a separate report was required for each manufacturing establishment (plant) with one employee or more. An establishment is defined as a single physical location where manufacturing is performed. A company, on the other hand, is defined as a business organization consisting of one establishment or more under common ownership or control.

If the company operated at different physical locations, even if the individual locations were producing the same line of goods, a separate report was requested for each location. If the company operated in two or more distinct lines of manufacturing at the same location, a separate report was requested for each activity.

An establishment not in operation for any portion of the year was requested to return the report form with the proper notation in the "Operational Status" section of the form. In addition, the establishment was requested to report data on any employees, capital expenditures, inventories, or shipments from inventories during the year.

In this report, data are shown for establishments in operation at any time during the year. A comparison with the number of establishments in operation at the end of the year will be provided in the Introduction of the General Summary subject report.

Employment and related items—The report forms requested separate information on production workers for a specific payroll period within each quarter of the year and on other employees as of the payroll period which included the 12th of March.

All employees—This item includes all full-time and part-time employees on the payrolls of operating manufacturing establishments during any part of the pay period which included the 12th of the months specified on the report form. Included are all persons on paid sick leave, paid holidays, and paid vacations during these pay periods.

Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average for the payroll periods including the 12th of March, May, August, and November.

Production workers—This item includes workers (up through the line-supervisor level) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial and guard services, product development, auxiliary production for plant's own use (e.g., power plant), recordkeeping, and other services closely associated with these production operations at the establishment covered by the report. Employees above the working-supervisor level are excluded from this item.

All other employees—This item covers nonproduction employees of the manufacturing establishment including those engaged in factory supervision above the line-supervisor level. It includes sales (including driver salespersons), sales delivery (highway truck drivers and their helpers), advertising, credit, collection, installation and servicing of own products, clerical and routine office function, executive, purchasing, financing, legal, personnel (including cafeteria, medical, etc.), professional, and technical employees. Also included are employees on the payroll of the manufacturing establishment engaged in the construction of major additions or alterations to the plant and utilized as a separate work force.

In addition to reports sent to operating manufacturing establishments, information on employment during the payroll period which included March 12 and annual payrolls also was requested of auxiliary units (e.g., administrative offices, warehouses, and research and development laboratories) of multiestablishment companies. However, these figures are not included in the totals for individual

industries shown in this report. They are included in the general summary and geographic area reports as a separate category.

Payroll—This item includes the gross earnings of all employees on the payroll of operating manufacturing establishments paid in the calendar year 1987. Respondents were told they could follow the definition of payrolls used for calculating the Federal withholding tax. It includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The total includes salaries of officers of corporations; it excludes payments to proprietors or partners of unincorporated concerns. Also excluded are payments to members of Armed Forces and pensioners carried on the active payroll of manufacturing establishments.

The census definition of payrolls is identical to that recommended to all Federal statistical agencies by the Office of Management and Budget. It should be noted that this definition does not include employers' Social Security contributions or other nonpayroll labor costs, such as employees' pension plans, group insurance premiums, and workers' compensation.

The ASM provides estimates of employers' supplemental labor costs, both those required by Federal and State laws and those incurred voluntarily or as part of collective bargaining agreements. (Supplemental labor costs are explained later in this appendix.)

As in the case of employment figures, the payrolls of separate auxiliary units of multiestablishment companies are not included in the totals for individual industries or industry groups.

Production-worker hours—This item covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave.

Cost of materials—This term refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuel consumed, whether purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (1) all raw materials, semifinished goods, parts, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year, (2) electric energy purchased, (3) fuels consumed for heat, power, or the generation of electricity, (4) work done by

others on materials or parts furnished by manufacturing establishments (contract work), and (5) products bought and resold in the same condition. (See discussion of duplication of data below.)

Specific materials consumed—In addition to the total cost of materials, which every establishment was required to report, information also was collected for most manufacturing industries on the consumption of major materials used in manufacturing. The inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. Information on the establishments consuming less than a specified amount (usually \$10,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which either administrative records or short forms were used was imputed as "not specified by kind." (See the introduction for the importance of administrative records in the industry.)

Value of shipments—This item covers the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts, such as receipts for contract work performed for others, installation and repair, sales of scrap, and sales of products bought and resold without further processing. Included are all items made by or for the establishments from materials owned by it, whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, including not only the direct cost of production but also a reasonable proportion of "all other costs" (including company overhead) and profit. (See discussion of duplication of data below.)

Individual products—As in previous censuses, data were collected for most industries on the quantity and value of individual products shipped. In the 1987 census program, information was collected on the output of approximately 11,000 individual product items. The term "product", as used in the census of manufactures, represents the finest level of detail for which output information was requested. Consequently, it is not necessarily synonymous with the term "product" as used in the marketing sense. In some cases, it may be much more detailed and, in other cases, it is more aggregative. For example, "pharmaceutical preparations" was distributed into over 100 terms; whereas, "motor gasoline" was reported as a single item.

Approximately 6,600 of the product items were listed separately on the 1987 census report forms. Data for

about 4,400 products were obtained in the monthly, quarterly, or annual surveys comprising the Current Industrial Reports series of the Census Bureau. Totals for the year 1987 for these items, as derived from the commodity surveys, are shown in the "products shipped" table (table 6a-2).

The list of products for which separate information was collected was prepared after consultation with industry and government representatives. Comparability with previous figures was given considerable weight in the selection of product categories so that comparable 1982 information is presented for most products.

Typically, both quantity and value of shipments information were collected. However, if quantity was not significant or could not be reported by manufacturers, only value of shipments was collected.

Shipments include both commercial shipments and transfers of products to other plants of the same company. For industries in which a considerable portion of the total shipments is transferred to other plants of the same company, separate information on interplant transfers also was collected. Moreover, for products that are used to a large degree within the same establishment as materials or components in the fabrication of other products, total production and often consumption of the item within the plant was collected. Typically, the information on production also was collected for products for which there are significant differences between total production and shipments in a given year because of wide fluctuations in finished goods inventories. Other measures of output of products with long production cycles were used as appropriate and feasible.

Classes of products—To summarize the product information, the separate products were aggregated into classes of products that, in turn, were grouped into all primary products of each industry. The code structure used is a seven-digit number for the individual product, a five-digit number for the class of product, and a four-digit number for the total primary products in an industry. (See Introduction, Industry Classification of Establishments, for application of the coding structure to the assignment of SIC codes for establishments.)

In the 1987 census, the 11,000 products were grouped into approximately 1,500 separate classes on the basis of general similarity of manufacturing processes, types of materials used, and the like. However, the grouping of products was affected by the economic significance of the class and, in some cases, dissimilar products were grouped because the products were not sufficiently significant to warrant separate classes.

Duplication in cost of materials and value of shipments—The aggregate of the cost of materials and value of shipments figures for industry groups and for all manufacturing industries includes large amounts of duplication since the products of some industries are used as materials by others. This duplication results, in part, from the

addition of related industries representing successive stages in the production of a finished manufactured product. Examples are the addition of flour mills to bakeries in the food group and the addition of pulp mills to paper mills in the paper and allied products group of industries. Estimates of the overall extent of this duplication indicate that the value of manufactured products exclusive of such duplication (the value of finished manufactures) tends to approximate two-thirds of the total value of products reported in the annual survey.

Duplication of products within individual industries is significant within a number of industry groups, e.g., machinery and transportation industries. These industries frequently include complete machinery and their parts. In this case, the parts made for original equipment are materials consumed for assembly plants in the same industry.

Even when no significant amount of duplication is involved, value of shipments figures are deficient as measures of the relative economic importance of individual manufacturing industries or geographic areas because of the wide variation in ratio of materials, labor, and other processing costs of value of shipments, both among industries and within the same industry.

Before 1962, cost of materials and value of shipments were not published for some industries which included considerable duplication. Since then, these data have been published for all industries at the United States level and beginning in 1964, for all geographic levels.

Value added by manufacture—This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments (products manufactured plus receipts for services rendered). The result of this calculation is adjusted by the addition of value added by merchandising operations (i.e., the difference between the sales value and the cost of merchandise sold without further manufacture, processing, or assembly) plus the net change in finished goods and work-in-process between the beginning- and end-of-year inventories.

For those industries where value of production is collected instead of value of shipments (see footnote in table 1a), value added is adjusted only for the change in work-in-process inventories between the beginning and end of year. For those industries where value of work done is collected, the value added does not include an adjustment for the change in finished goods or work-in-process inventories.

"Value added" avoids the duplication in the figure for value of shipments that results from the use of products of some establishments as materials by others. Value added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

New and used capital expenditures—For establishments in operation and any known plants under construction, manufacturers were asked to report their new expenditures for (1) permanent additions and major alterations to

manufacturing establishments, and (2) machinery and equipment used for replacement and additions to plant capacity if they were of the type for which depreciation accounts were ordinarily maintained.

The totals for new expenditures include expenditures leased from nonmanufacturing concerns through capital leases, new facilities owned by the Federal Government but operated under contract by private companies, and plant and equipment furnished to the manufacturer by communities and nonprofit organizations. Also excluded are expenditures for used plant and equipment (although reported in the census), expenditures for land, and cost of maintenance and repairs charged as current operating expenses.

Manufacturers also were requested to report the value of all used buildings and equipment purchased during the year at the purchase price. For any equipment or structure transferred for the use of the reporting establishment by the parent company or one of its subsidiaries, the value at which it was transferred to the establishment was to be reported. Furthermore, if the establishment changed ownership during the year, the cost of the fixed assets (building and equipment) was to be reported under used capital expenditures.

Total expenditures for used plant and equipment is a universe figure; it is collected on all census forms. However, the breakdown of this figure between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. The data for total new capital expenditures, new building expenditures, and new machinery expenditures, as well as the data for total used expenditures, are shown in table 3b.

End-of-year inventories—Respondents were asked to report their 1986 and 1987 end-of-year inventories at cost or market. Effective with the 1982 Economic Censuses, this change to a uniform instruction for reporting inventories was introduced for all sector reports. Prior to 1982, respondents were permitted to value inventories using any generally accepted accounting method (FIFO, LIFO, market, to name a few). In 1982, LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve.

SECTION 2. ITEMS COLLECTED ONLY ON ASM REPORT FORMS

The following items were collected only from establishments included in the ASM sample:

1. **Supplemental labor costs**—Supplemental labor costs are divided into legally required expenditures and payments for voluntary programs. The legally required portion consists primarily of Federal old age and survivors' insurance, unemployment compensation, and workers' compensation. Payments for voluntary programs include all programs not

Because of this change in reporting instructions, the 1982 through 1987 data for inventories and value added by manufacture included in the tables of this report are not comparable to the prior-year data shown in table 1a of this report and in historical census of manufactures and annual survey of manufactures publications.

In using inventory data by stage of fabrication for "all industries" and at the two-digit industry level, it should be noted that an item treated as a finished product by an establishment in one industry may be reported as a raw material by another establishment in a different industry. For example, the finished-product inventories of a steel mill would be reported as raw materials by a stamping plant. Such differences are present in the inventory figures by stage of fabrication shown for individual industries, industry groups, and "all manufacturing", which are aggregates of figures reported by establishments in specified industries.

Specialization and coverage ratios—These items are not collected on the report forms but are derived from the data shown in table 5b. An establishment is classified in a particular industry if its shipments of primary products of that industry exceed in value its shipments of the products of any other single industry.

As noted in the introduction, an establishment's shipments include those products assigned to an industry (primary products), those considered primary to other industries (secondary products), and receipts for miscellaneous activities (merchandising, contract work, resales, etc.). Specialization and coverage ratios have been developed to measure the relationship of primary product shipments to the data on shipments for the industry shown in tables 1a through 5a and data on product shipments shown in tables 6a through 6c.

Specialization ratio represents the ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for the establishments classified in the industry.

Coverage ratio represents the ratio of primary products shipped by the establishments classified in the industry to the total shipments of such products that are shipped by all manufacturing establishments wherever classified.

specifically required by legislation whether they were employer initiated or the result of collective bargaining. They include the employer portion of such plans as insurance premiums, premiums for supplemental accident and sickness insurance, pension plans, supplemental unemployment compensation, welfare plans, stock purchase plans on which the employer payment is not subject to withholding tax, and deferred profit-sharing plans.

They exclude such items as company-operated cafeterias, in-plant medical services, free parking lots, discounts on employee purchases, and uniforms and work clothing for employees. While the excluded items do benefit employees and all or part of their cost generally is similar to the items covered in the ASM labor costs statistics, accounting records generally do not provide reliable figures on net employee benefits of these types.

2. **Retirements of depreciable assets**—Included in this item is the gross value of assets sold, retired, scrapped, destroyed, etc., during 1987. When a complete operation or establishment changed ownership, the respondent was instructed to report the value of the assets sold at the original cost as recorded in the books of the seller. The respondent also was requested to report retirements of equipment or structures owned by a parent company that the establishment was using as if it were a tenant.
3. **Depreciation charges for fixed assets**—This item includes depreciation and amortization charged during the year against assets. Depreciation charged against fixed assets acquired since the beginning of the year and against assets sold or retired during the year are components of this category. Respondents were requested to make certain that they did not report accumulated depreciation.
4. **Rental payments**—Total rental payments is collected on all census forms. However, the breakdown between rental payments for buildings and other structures and rental payments for machinery and equipment is collected only on the ASM forms. This item includes rental payments for the use of all items for which depreciation reserves would be maintained if they were owned by the establishment, e.g., structures and buildings, and production, office, and transportation equipment. Excluded are royalties and other payments for the use of intangibles and depletable assets, and land rents where separable.

When an establishment of a multiestablishment company was charged rent by another part of the same company for the use of assets owned by the company, it was instructed to exclude that cost from rental payments. However, the book value (original cost) of these company-owned assets was to be reported as assets of the establishment at the end of the year.

If there were assets at an establishment rented from another company and the rents were paid centrally by the head office of the establishment, the company was instructed to report these rental payments as if they were paid directly by the establishment.

5. **Depreciable assets**—Total value of gross depreciable assets is collected on all census forms.

However, the detail for depreciable assets is collected only on the ASM forms. The data encompass all fixed depreciable assets on the books of establishments at the beginning and end of the year. The values shown (book value) represent the actual cost of assets at the time they were acquired, including all costs incurred in making the assets usable (such as transportation and installation). Included are all buildings, structures, machinery, and equipment (production, office, and transportation equipment) for which depreciation reserves are maintained. Excluded are nondepreciable capital assets, including inventories and intangible assets, such as timber and mineral rights.

The definition of fixed depreciable assets is consistent with the definition of capital expenditures. For example, expenditures include actual capital outlays during the year, rather than the final value of equipment put in place and buildings completed during the year. Accordingly, the value of assets at the end of the year includes the value of construction in progress. In addition, respondents were requested to make certain that assets at the beginning of the year plus new and used capital expenditures, less retirements, equalled assets at the end of the year.

6. **New and used capital expenditures**—The data for total new capital expenditures, new building expenditures, new machinery expenditures, and total used capital expenditures are collected on all census forms. However, the breakdown between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. (See further explanation on capital expenditures in section 1.)
7. **Quantity of electric energy consumed for heat and power**—Data on the cost of purchased electric energy were collected on all census forms. However, data on the quantity of purchased electric energy were collected only on the ASM forms. In addition, information was collected on the quantity of electric energy generated by the establishment and the quantity of electric energy sold or transferred to other plants of the same company.
8. **Breakdown of new capital expenditures for machinery and equipment**—ASM establishments were requested to separate their capital expenditures for new machinery and equipment into (1) automobiles, trucks, etc., for highway use, (2) computers and peripheral data processing equipment, and (3) all other.

The category "automobiles, trucks, etc., for highway use" is intended to measure expenditures for vehicles designed for highway use that were acquired through a purchase or lease-purchase agreement.

Vehicles normally operating off public highways (vehicles specifically designed to transport materials, property, or equipment on mining, construction, logging, and petroleum development projects) are excluded from this item.

9. **Foreign content of cost of materials**—Establishments included in the ASM sample panel were requested to provide information on foreign-made materials purchased or transferred from foreign sources. This includes materials acquired from a central warehouse or other domestic establishment of the same company but made in an operation outside of the 50 States, District of Columbia, Puerto Rico, or U.S. territories.
10. **Cost of purchased services**—ASM establishments were requested to provide information on the cost of purchased services for the repair of buildings and other structures, the repair of machinery, and communication services. Included in the cost of purchased services for the repair of buildings and machinery are payments made for all maintenance and repair work on buildings and equipment, such as painting, roof repairs, replacing parts, and overhauling equipment. Such payments made to other establishments of the same company and for repair and maintenance of any leased property also are included. Extensive repairs or reconstruction that were capitalized are considered capital expenditures for used buildings and machinery and are, therefore, excluded from this item. Repair and maintenance costs provided by an owner as part of a rental contract or incurred directly by an establishment in using its own work force also are excluded.

Three basic approaches were utilized to produce these statistics.

1. For items 1 through 6, data were estimated (imputed) for all non-ASM establishments using the available data in the establishment record and industry-based parameters. The statistics were then generated by simply tabulating all census records including the imputed value for non-ASM establishments and the unweighted value for ASM establishments. Separate imputation rates were developed and are shown in the table. For quantity of purchased electricity for heat and power (item 7), a similar procedure was used; however, the imputation parameters were geographically-based instead of industry-based. For quantities of generated less sold electricity, no imputation was performed for non-ASM establishments. The estimates for these items are simply tabulations of unweighted ASM values.

Since the published statistics for these items were developed from the complete census universe and not just the ASM establishments, there are no sampling variances associated with these statistics. However, there is an unknown level of bias for each of the items due to the imputation of the non-ASM establishments. This bias is felt to be small due to the strong correlation between the items being imputed and the collected items that were used to generate the impute values.

2. For items 8 and 9, the estimates were developed using a ratio estimation methodology. For item 8, an estimate of the breakout of new capital expenditures for machinery and equipment into the three categories was made from ASM establishments reporting these categories. The estimated proportions were then applied to the corresponding Census value for new capital expenditures for machinery and equipment to produce the estimates.

The estimates for item 9, foreign content of cost of materials, were developed in a similar manner based on costs of parts, supplies, and components (item 5a) as the control total for the three categories.

For items 8 and 9, an adjustment ratio of the following form was computed.

$$R_j = \frac{NM_c}{TME_{asm}}$$

where:

NM_c = the census value of new capital expenditures for machinery and equipment

TME_{asm} = the weighted ASM value of new capital expenditures for machinery and equipment from reporters of the detailed breakout data

3. For item 10, cost of purchased services, the estimates were made by simply tabulating weighted data for all the ASM records that reported the item. A response coverage ratio (a measure of the extent to which respondents reported for each item) is shown in table 3c for the three types of services. It is derived for each item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight, see appendix B) for those ASM establishments that reported the specific inquiry to the weighted total employment for all ASM establishments classified in the industry.

APPENDIX B.

Annual Survey of Manufactures (ASM) Sampling and Estimating Methodologies

DESCRIPTION OF SURVEY SAMPLE

The Annual Survey of Manufactures (ASM) contains two components. The mail portion of the survey is a probability sample of about 56,000 manufacturing establishments selected from a total of about 220,000 establishments. These 220,000 establishments represent all manufacturing establishments of multiunit companies and all single establishment companies mailed schedules in the 1982 Census of Manufactures. This mail portion is supplemented annually by a Social Security Administration list of new manufacturing establishments opened after 1982 and a list of new multiunit manufacturing establishments identified from the Census Bureau's Company Organization Survey.

The 1984 through 1988 ASM sample differs slightly from the previous sample. For the current panel, all establishments of companies with 1982 shipments in manufacturing in excess of \$500 million were included in the survey panel with certainty. There are approximately 500 such companies collectively accounting for approximately 18,000 establishments. For the remaining portion of the mail survey, the establishment was defined as the sampling unit. For this portion, all establishments with 250 employees or more and establishments with a very large value of shipments also were included in the survey panel with certainty. A total of 12,100 establishments were selected from this portion of the universe with certainty. Therefore, of the 56,000 manufacturing establishments included in the ASM panel, approximately 31,000 are selected with certainty. These certainty establishments collectively account for approximately 80 percent of the total value of shipments in the 1982 census.

Smaller establishments in the remaining portion of the mail survey were sampled with probabilities ranging from 0.999 to 0.005 in accordance with mathematical theory for optimum allocation of a sample. The probabilities of selection assigned to the smaller establishments were proportional to measures of size determined for each establishment. The measures of size depend directly upon each establishment's 1982 product class values and the historic variability of the year-to-year shipments of each product class. Product classes displaying more volatile year-to-year change in shipments at the establishment level were sampled at a heavier rate.

This method of assigning measures of size was used in order to maximize the precision (that is, minimize the variance of estimates of the year-to-year change) in the value of product class shipments. Implicitly, it also gave weight differences in employment, value added, and other

general statistics, since these are highly correlated with value of shipments. Individual sample selection probabilities were obtained by multiplying each establishment's final measure of size by an overall sampling fraction coefficient calculated to yield a total expected sample size.

The sample selection procedure gave each establishment in the sampling frame an independent chance of selection. This method of independent selection permits the rotation of small establishments out of a given sample panel without introducing a bias into the survey estimates.

The nonmail portion of the survey includes all single-establishment companies that were tabulated as administrative records in the 1982 Census of Manufactures. Although this portion contained approximately 130,000 establishments, it accounted for less than 2 percent of the estimate for total value of shipments at the total manufacturing level. This portion was not sampled; rather, the data for every establishment in this group were estimated based on selected information obtained annually from the administrative records of the Internal Revenue Service and the Social Security Administration. This administrative-record information, which includes payroll, total employment, industry classification, and physical location of the establishment, was obtained under conditions which safeguard the confidentiality of both tax and census records. Estimates of data other than payroll and employment for these small establishments were developed from industry averages.

The corresponding estimates for the mail and nonmail establishments were added together, along with the base-year differences, as defined in the Description of Estimating Procedure section, to produce the figures shown in this publication.

DESCRIPTION OF ESTIMATING PROCEDURES

Most of the ASM estimates for the years 1983-1986 were computed using a difference estimation procedure. For each item, a base-year difference was developed. This base-year difference is equal to the difference between the 1982 census published number for an item total and the linear ASM estimate of the total for 1982. The ASM linear estimate was obtained by multiplying each sample establishment's data by its sample weight (the reciprocal of its probability of selection) and summing the weighted values.

These base-year differences were then added to the corresponding current-year linear estimates, which include the sum of the estimates for the mail and nonmail establishments, to produce the estimates for the years 1983-1986. Estimates developed by this procedure usually are far more reliable than comparable linear estimates developed from the current sample data alone.

The 1987 sample estimates for the purchased service items, shown in table 3c, are strictly ASM linear estimates, however, developed only from ASM establishments that reported the specific item.

The remaining estimates in table 3c, showing the breakdown of expenditures for new machinery and equipment and costs of parts (separated into purchases from foreign sources and purchases from domestic sources), were computed as ratio estimates. To do this, linear estimates of the new machinery detail items were developed from the ASM establishments and were ratio adjusted to the corresponding census total for new machinery. In a similar fashion, the ASM linear estimates of the detailed purchased materials items were ratio adjusted to the corresponding census total for cost of parts.

QUALIFICATIONS OF THE DATA

The estimates developed from the sample are apt to differ somewhat from the results of a survey covering all companies in the sampled lists but otherwise conducted under essentially the same conditions as the actual sample survey. The estimates of the magnitude of the sampling errors (the differences between the estimates obtained and the results theoretically obtained from a comparable, complete-coverage survey) are provided by the standard errors of the estimates.

The particular sample selected for the ASM is one of a large number of similar probability samples that, by chance, might have been selected under the same specifications. Each of the possible samples would yield somewhat different sets of results, and the standard errors are measures of the variation of all the possible sample estimates around the theoretical, comparable, complete-coverage values.

Estimates of the standard errors have been computed from the sample data for selected statistics in this report. They are presented in the form of relative standard errors (the standard errors divided by the estimated values to which they refer).

In conjunction with its associated estimate, the relative standard error may be used to define confidence intervals (ranges that would include the comparable, complete-coverage value for specified percentages of all the possible samples).

The complete coverage value would be included in the range:

1. From one standard error below to one standard error above the derived estimate for about two-thirds of all possible samples.
2. From two standard errors below to two standard errors above the derived estimate for about 19 of 20 of all possible samples.
3. From three standard errors below to three standard errors above the derived estimate for nearly all samples.

An inference that the comparable, complete-survey result would be within the indicated ranges would be correct in approximately the relative frequencies shown. Those proportions, therefore, may be interpreted as defining the confidence that the estimates from a particular sample would differ from complete-coverage results by as much as one, two, or three standard errors, respectively.

For example, suppose an estimated total is shown as 50,000 with an associated relative standard error of 2 percent, that is, a standard error of 1,000 (2 percent of 50,000). There is approximately 67 percent confidence that the interval 49,000 to 51,000 includes the complete-coverage total, about 95 percent confidence that the interval 48,000 to 52,000 includes the complete-coverage total and almost certain confidence that the interval 47,000 to 53,000 includes the complete coverage total.

In addition to the sample errors, the estimates are subject to various response and operational errors: errors of collection, reporting, coding, transcription, imputation for nonresponse, etc. These operational errors also would occur if a complete canvass were to be conducted under the same conditions as the survey. Explicit measures of their effects generally are not available. However, it is believed that most of the important operational errors were detected and corrected in the course of the Bureau's review of the data for reasonableness and consistency. The small operational errors usually remain. To some extent, they are compensating in the aggregated totals shown. When important operational errors were detected too late to correct the estimates, the data were suppressed or were specifically qualified in the tables.

As derived, the estimated standard errors included part of the effect of the operational errors. The total errors, which depend upon the joint effect of the sampling and operational errors, are usually of the order of size indicated by the standard error, or only moderately higher. However, for particular estimates, the total error may considerably exceed the standard errors shown.

The concept of complete coverage under the conditions prevailing for the ASM is not identical to the complete coverage of the census of manufactures, as the censuses have been conducted. Nearly all types of operational errors that affect the ASM also occur in the censuses. The ASM and the censuses, are conducted under quite different conditions, and operational errors can be better controlled in the ASM than in the censuses. As a result, for many of the census figures, the errors are of the same order of size as the total errors of the corresponding annual survey estimates. The differences between the census and ASM operating conditions also disturb, to some degree, the comparability of the ASM and census data.

Any figures shown in the tables in this publication having an associated standard error exceeding 15 percent may be of limited reliability. However, the figure may be combined with higher-level totals, creating a broader aggregate, which then may be of acceptable reliability.

APPENDIX C.

Changes in Census of Manufactures

Product Classes for 1987

[Based on revisions to the Standard Industrial Classification (SIC) Manual, definitions of some product classes were revised for 1987. Listed below are the revisions to the product classes]

1987	1982	1987	1982	1987	1982	1987	1982
30521	30411	30899 3089A	3079K pt	34919	34948	35483	36233
30522	30412	32295	32291 pt	34921	3494B	35484	35496
30523	30413	32296	32292 pt	34922	3494C	35485	35495 pt 35497
30524	30414	32297	32294 pt	34923	3494D	35533	35531 pt
30525	30415	32298	32291 pt 32292 pt 32294 pt	34924	3494E	35534	35532 pt
30526	30416	32311	32317	34925	3494F	35543	35541 35542 pt
30534	32934	32312	32317	34926	3494G	35544	35542 pt
30535	32935	32927	32928 32929	34927	3494H	35558	35557 pt
30536	32936	32961	32963 32965	3523C	35234 pt 35237 35238 pt	35561	35511
30537	32937	32962	32964 32966	3523E	35234 pt 35238 pt	35562	35512
30538	32938	33152	33152 34967	3523F	3523A 3523B	35563	35513 pt
30539	32939	33391	33331	35246	35243 35245	35591	35591 35699 pt
30611	3069A pt	33392	33334	3531A	35311	35596	35595 pt
30612	3069A pt	33398	33321 33323 33399	3531B	35312	35597	35494
30613	3069A pt	33561 33562 33563	33569	3531C	35317	35599	35595 pt 36360 36362
30614	3069B pt	33630	33611	3531E	35314 pt	35616	3561C
30615	3069B pt	33640	33620 pt 33691 pt 33692 pt 33693 pt	3531F	35316	35631	35631 pt
30616	3069B pt	33650	33612	3531G	35318 pt	35651	35513 pt 35514 pt 35691 pt
30617	3069B pt	33660	33620 pt	3531H	35313 pt 35318 pt 35319 pt	35652	35513 pt 35514 pt 35691 pt
3069C	3069C 35557 pt	33690	33691 pt 33692 pt 33693 pt	3531K	35319 pt 35361 pt 35371 pt	35676	35672
3069E	30310	34234	34232 pt	3531M	35313 pt 35314 pt 35319 pt 35372 pt	35692	35694 35695 35696
30810	30792	34235	34232 pt 35531 pt 35532 pt	35337	35331 35332 pt	35697 35698	35699 pt
30820	3079K pt	34236	34233	35338	35332 pt	35711	35731 36629 pt
30830	3079K pt	34441 34443 34447 34448 34449	34446	35339	35333	35712	35734 pt 35735 pt
30840	30794	34461 34462 34463 34464 34465	34460	3533A	35335	35721	35732 pt
30850	30795	34911 34912 34913 34914 34915 34916	3494A	3533B	35336	35722	35734 pt 35735 pt
30861 30862 30863 30864 30865 30866	30797	34917	34949	35363	35361 pt	35751	35732 pt 36612 pt
30870	3079K pt	34918	34947	35364	35362 pt	35752	35734 pt 35735 pt
30880	3079J pt 3079K pt	34696 34699	34699	35373	35362 pt 35371 pt	35771	35732 pt
30891	3079J pt 3079K pt	35411 35412		35374	35362 pt 35372 pt	35772	35734 pt 35735 pt
30892	3079J pt 3079K pt	35430	35650	3541D	35411 35412	35781	35743
30893	3079J pt 3079K pt	35454	35453	35430	35650	35782	35744
30894	3079J pt 3079K pt	35455	35452	35454	35453	35783	35745
30895	3079J pt 3079K pt	35481	36231	35455	35452	3585C	3585A 36993
30896	2499A pt 3079J pt 3079K pt	35482	36232	35481	36231	3585D	3585B 36994 pt
30897	3079J pt 3079K pt			35482	36232		
30898	3079J pt 3079K pt						

[Based on revisions to the Standard Industrial Classification (SIC) Manual, definitions of some product classes were revised for 1987. Listed below are the revisions to the product classes]

1987	1982	1987	1982	1987	1982	1987	1982
35931	35996 35997	36411	36410	36991—Con. 36995	36629 pt—Con.	38731—Con.	38734—Con. 38736 38737
35932	35998	36412	36994 pt	36997	35497 pt 36629 pt	39113 39114	39112
35933	35999	36520	36521 pt	36998	36994 pt	39153 39154	39151
35941	35617 35618 35631 pt	36613	35732 pt 36612 pt	3714A	37143	39447	36629 pt 39447
35942	3561A 3561B 35631 pt	36614	36612 pt	37999	37994 37998	39493	39494 pt
35961 35962 35963	35760	36631	36621 36629 pt	38121	38111	39495	3079k pt
36123 36126	36125	36632	36622	38122	36625 pt 36629	39496	39494 pt
36251	36138 pt 36794	36691	36624	38210	38112 38113 pt	39523	39521 39522 pt
36252	36221	36692	36626	38260	38320 38326	39524	39522 pt
36253	36222	36693	36628	38271	38324	39651	39630
36254	36138 pt 36223	36714	36711 36712	38272 38273	38325	39654	39641
36330	36331 36333	36715	36799 pt	38295	36625 pt 38293	39656	39642
36395	36361 36394 36399	36720	36797	38296	38113 pt	39998	39620
		36799	36629 pt 36799 pt	38440	36931	39999	39995
		36950	35732 pt 36792	38450	36930 36933	97372	36522
		36991 36992	36629 pt	38731	38734	97819	36521 pt

APPENDIX D.

Changes in Census of Manufactures

Product Codes for 1987

[Based on revisions to the Standard Industrial Classification (SIC) Manual, definitions of some product codes were revised for 1987. Listed below are the revisions to the product codes. The terms published and collected are defined as follows: (1) published refers to the code used in the published reports for 1987 and 1982, and (2) collected refers to the code appearing on the report forms for 1987]

1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
30118 00	30118 00	30118 19 30118 20	30539 77	32939 77	32939 77	30830 11 30830 13 30830 19	30793 01 30793 03 30793 09	3079K 90	30892 20— Con.	3079D 33— Con.	3079J 61 pt —Con. 3079J 66 pt 3079K 93 pt
3011A 39	3011A 39	3011A 33 3011A 35	30539 79	32939 79	32939 79	30840 11	30794 21	30794 21	30892 30	3079D 35	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
3011C 29	3011C 29	3011C 24 3011C 26 3011C 27	30611 00	3069A 00	3069A 11	30840 12	30794 22	30794 22			
30521 00	30411 00	30411 00	30612 00	3069A 00	3069A 12 3069A 15	30840 13	30794 23	30794 23			
30522 00	30412 00	30412 00	30613 00	3069A 00	3069A 13 3069A 14 3069A 16	30840 14	30794 24	30794 24	30892 90	3079D 39	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30523 00	30413 00	30413 00	30614 00	3069B 00	3069B 11	30840 15	30794 25	30794 25			
30524 00	30414 00	30414 00	30615 00	3069B 00	3069B 12 3069B 13 3069B 14 3069B 19	30840 19	30794 26	30794 26			
30525 00	30415 00	30415 00	30616 00	3069B 00	3069B 21	30850 00	30795 00	30795 00			
30526 00	30416 00	30416 00	30617 00	3069B 00	3069B 29	30861 00	30797 41	30797 41	30893 00	3079F 22	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30534 11	32934 11	32934 11	30697 77	30697 77	30697 11 30697 78	30862 10 30862 20 30862 90	30797 51 30797 53 30797 59	30797 42	30894 01	30798 01	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30534 13	32934 13	32934 13	3069C 12	35558 72	35557 72	30863 10 30863 90	30797 61 30797 69	30797 44			
30534 15	32934 15	32934 15	3069C 30	35558 76	35557 76	30864 10 30864 20 30864 30 30864 90	30797 71 30797 73 30797 75 30797 79	30797 45	30894 02	30798 02	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30535 11	32935 11	32935 11	3069D 20	3069D 20	3069D 17 3069D 19	30865 10 30865 20 30865 30 30865 40 30865 90	30797 81 30797 83 30797 85 30797 86 30797 89	30797 46			
30535 13	32935 13	32935 13	3069D 42	3069D 42	3069D 55 3069D 58	30866 10	30797 43	30797 43	30894 03	30798 03	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30535 15	32935 15	32935 15	3069E 20	30310 00	30310 00	30866 90	30797 47	30797 47			
30535 17	32935 17	32935 17	30810 10	30792 11	30792 10 pt 30792 20 pt 30792 30 pt 30792 40 pt 30792 50 pt 30792 60 pt 30792 70 pt	30870 12 30870 13	30791 01 30791 02	3079K 99	30880 00	3079F 20	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30535 19	32935 19	32935 19	30810 20	30792 12	30792 10 pt 30792 20 pt 30792 30 pt 30792 40 pt 30792 50 pt 30792 60 pt 30792 70 pt	30891 01	3079C 11	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30894 04	30798 04	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30535 21	32935 21	32935 21	30810 30	30792 13	30792 10 pt 30792 20 pt 30792 30 pt 30792 40 pt 30792 50 pt 30792 60 pt 30792 70 pt	30891 03	3079C 13	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30894 05	30798 05	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30535 23	32935 23	32935 23	30810 40	30792 14	30792 10 pt 30792 20 pt 30792 30 pt 30792 40 pt 30792 50 pt 30792 60 pt 30792 70 pt	30891 09	3079C 19	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30894 06	30798 06	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30535 29	32935 29	32935 29	30810 50	30792 19	30792 10 pt 30792 20 pt 30792 30 pt 30792 40 pt 30792 50 pt 30792 60 pt 30792 70 pt	30892 10	3079D 31	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30894 07	30798 07	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30536 21	32936 21	32936 21	30820 10	30796 01	3079K 80	30892 20	3079D 33	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30894 09	30798 09	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt
30536 22	32936 22	32936 22	30820 20	30796 02							
30536 25	32936 25	32936 25	30820 30	30796 03							
30536 26	32936 26	32936 26	30820 40	30796 04							
30536 30	32936 30	32936 30	30820 50	30796 05							
30536 35	32936 35	32936 35	30820 60	30796 06							
30537 29	32937 29	32937 29	30820 70	30796 07							
30537 39	32937 39	32937 39	30820 80	30796 08							
30537 41	32937 41	32937 41	30820 90	30796 19							
30537 43	32937 43	32937 43									
30537 49	32937 49	32937 49									
30538 10	32938 10	32938 10									
30538 13	32938 13	32938 13									
30538 15	32938 15	32938 15									
30538 17	32938 17	32938 17									
30538 19	32938 19	32938 19									
30539 70	32939 70	32939 70									
30539 73	32939 73	32939 73									
30539 75	32939 75	32939 75									
									30895 01	30799 01	3079J 61 pt

published	collected	published	published	collected	published	published	collected	published	published	collected	published
30895 01— Con.	30799 01— Con.	3079J 61 pt —Con. 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt	30896 22— Con.	3079A 21— Con.	3079J 61 pt —Con. 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 05— Con.	3079B 25— Con.	3079J 61 pt —Con. 3079J 65 pt 3079J 66 pt 3079K 94 pt 3079K 99 pt	32927 15	32927 15	32929 11 32929 21
									32927 31	32927 31	32929 31
									32927 33	32927 33	32929 33
30895 02	30799 02	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt	30896 23	3079A 23	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 06	3079B 26	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 94 pt 3079K 99 pt	32927 34	32927 34	32929 34
									32927 36	32927 36	32929 36
									32927 41	32927 41	32929 41
30895 03	30799 03	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt	30896 24	3079A 25	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 07	3079B 27	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 94 pt 3079K 99 pt	32927 78	32927 78	32929 51 32929 73 32929 75
									32927 98	32927 98	32928 13 32929 98
									32961 11	32961 11	32963 11 32965 11
30896 11	3079A 11	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30896 25	3079A 27	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 08	3079B 28	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 94 pt 3179K 99	32961 31	32961 31	32963 31 32965 31
									32961 35	32961 35	32963 35 32965 35
									32961 38	32961 38	32963 38 32965 38
30896 12	3079A 12	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30896 26	3079A 28	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 09	3079B 29	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 94 pt 3179K 99	32961 51	32961 51	32963 51 32965 51
									32961 61	32961 61	32963 61 32965 61
									32961 98	32961 98	32963 98 32965 98
30896 13	3079A 13	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30896 27	2499A 94 3079A 29	2499A 94 3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	3089A 11	3079F 41	3079K 93 pt 3079K 94 pt 3079K 95 pt 3079K 99 pt	32962 31	32962 31	32964 31 32966 31
									32962 34	32962 34	32964 34 32966 34
									32962 36	32962 36	32964 36 32966 36
30896 14	3079A 14	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30897 01	3079F 25	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 95 pt	3089A 12	3079F 43	3079K 93 pt 3079K 94 pt 3079K 95 pt 3079K 99 pt	32962 45	32962 45	32964 45 32966 45
									32962 51	32962 51	32964 51 32966 51
									32962 61	32962 61	32964 61 32966 61
30896 15	3079A 15	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30897 09	3079F 27	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 95 pt	3089A 14	3079F 47	3079K 93 pt 3079K 94 pt 3079K 95 pt 3079K 99 pt	32962 83	32962 83	32964 83 32966 83
									32962 00	32962 00	32964 00 32966 00
									32962 00	32962 00	32964 00 32966 00
30896 16	3079A 16	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64									

[Based on revisions to the Standard Industrial Classification (SIC) Manual, definitions of some product codes were revised for 1987. Listed below are the revisions to the product codes. The terms published and collected are defined as follows: (1) published refers to the code used in the published reports for 1987 and 1982, and (2) collected refers to the code appearing on the report forms for 1987]

1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
33152 03— Con.	33152 03— Con.	33152 11 pt —Con. 34967 19 pt	33157 42— Con.	33157 42— Con.	33157 31 pt —Con. 33157 71 pt	33561 66— Con.	33561 66— Con. 33562 78 33563 91 33569 91	33569 92— Con.	34236 21	34236 21	34233 21
33152 05	33152 05	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 13 pt 34967 17 pt 34967 19 pt	33157 43	33157 43	33157 31 pt 33157 61 pt 33157 71 pt	33630 00	33611 00	33611 00	34236 31	34236 31	34233 31
			33159 44 33159 45 33159 48	33159 44 33159 45 33159 48	33159 49	33640 11	33620 42	33620 42	34236 41	34236 41	34233 41
						33640 21	33691 51	33691 51	34236 81	34236 81	34238 81
						33640 31	33692 31	33692 31	34236 99	34236 99	34233 99
33152 07	33152 07	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33159 99	33159 99	33159 77 33159 98	33640 31	33692 31	33692 31	34292 12 34298 99	34292 12 34298 99	34298 98
			33211 21	33211 21	33211 22 pt 33211 24 pt 33211 27 pt 33211 30 pt	33640 41	33693 71	33693 71	34320 01 34320 03	34320 01 34320 03	34320 04
						33640 51	33693 91	33693 91	34320 05 34320 07	34320 05 34320 07	34320 06
			33211 23	33211 23	33211 22 pt 33211 24 pt 33211 27 pt 33211 30 pt	33650 11	33612 11	33612 11	34320 09 34320 11	34320 09 34320 11	34320 08
33152 09	33152 09	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt				33650 31	33612 31	33612 31	34320 14 34320 25 34320 35	34320 14 34320 25 34320 35	34320 98
			33211 25	33211 25	33211 33 pt 33211 36 pt 33211 39 pt 33211 42 pt	33650 51	33612 51	33612 51	34320 47 34320 48	34320 47 34320 48	34320 79
						33650 61	33612 61	33612 61	34320 67 34320 69	34320 67 34320 69	34320 65
33152 10	33152 10	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33211 26	33211 26	33211 33 pt 33211 36 pt 33211 39 pt 33211 42 pt	33660 20	33620 20	33620 20	34320 71 34320 74 34320 75	34320 71 34320 74 34320 75	34320 98
			33217 31	33217 31	33217 32 pt 33217 34 pt 33217 37 pt 33217 40 pt	33660 21	33620 21	33620 21	34320 80 34320 82	34320 80 34320 82	34320 55
						33660 22	33620 22	33620 22	34320 84 34320 86	34320 84 34320 86	34320 56
33152 12	33152 12	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33217 33	33217 33	33217 32 pt 33217 34 pt 33217 37 pt 33217 40 pt	33660 23	33620 23	33620 23	34320 90 34320 91	34320 90 34320 91	34320 40
						33660 24	33620 24	33620 24	34432 52 34432 54 34432 56 34432 98	34432 52 34432 54 34432 56 34432 98	34432 99
			33217 35	33217 35	33217 43 pt 33217 46 pt 33217 49 pt 33217 52 pt	33660 25	33620 25	33620 25	34433 13	34433 13	34433 12 34433 14 34433 48 pt
33152 14	33152 14	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt				33660 31	33620 31	33620 31	34433 17	34433 17	34433 16 34433 18 34433 48 pt
			33252 11	33252 11	33252 12 33252 13	33660 41	33620 51	33620 51	34433 22	34433 22	34433 21 34433 23 34433 48 pt
			33217 36	33217 36	33217 43 pt 33217 46 pt 33217 49 pt 33217 52 pt	33660 51	33620 51	33620 51	34433 32	34433 32	34433 31 34433 33 34433 48 pt
						33660 61	33620 61 pt	33620 61 pt	34433 38	34433 38	34433 45
						33660 72	33620 72	33620 72	34433 39	34433 39	34433 48 pt
						33690 11	33691 61	33691 61	34433 49	34433 49	34433 50
33152 16	33152 16	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33252 11	33252 11	33252 12 33252 13	33690 15	33692 11	33692 11	34434 13	34434 13	34434 12 pt
			33391 00	33331 00	33331 00	33690 21	33692 33	33692 33	34434 15	34434 15	34434 18 pt
			33392 31	33334 31	33334 31	33690 25	33692 41	33692 41	34434 17	34434 17	34434 18 pt
			33392 37	33334 37	33334 35 pt	33690 91 33690 98	33693 94 33693 99	33693 99	34434 19	34434 19	34434 20 pt
33152 22	33152 22	33152 33 pt 34967 23 pt	33392 39	33334 39	33334 38 pt	33991 91 33991 98	33991 91 33991 98	33991 99	34434 21	34434 21	34434 22 pt
			33392 41	33334 41	33334 41	34234 11	34234 11	34232 31	34434 23	34434 23	34434 24 pt
33152 23	33152 23	33152 23 34967 19 pt	33392 43	33334 43	33334 45 pt	34234 22	34234 22	34232 83	34434 25	34434 25	34434 26 pt
33152 25	33152 25	33152 25 34967 21	33392 49	33334 49	33334 48 pt	34234 33	34234 33	34232 85	34434 27	34434 27	34434 28 pt
33152 30	33152 30	33152 33 pt 34967 23 pt	33392 51	33334 51	33334 35 pt 33334 38 pt 33334 45 pt 33334 48 pt	34234 44 34234 98	34234 44 34234 98	34232 99	34434 29	34434 29	34434 30 pt
33156 15 33156 17	33156 15 33156 17	33156 13	33392 55	33334 55	33334 55	34235 11	34235 11	34232 53	34434 31	34434 31	34434 32 pt
33156 22 33156 24	33156 22 33156 24	33156 21	33398 01	33321 00	33321 00	34235 12	34235 12	34232 54	34434 33	34434 33	34434 34 pt
33157 21	33157 21	33157 31 pt 33157 61 pt 33157 71 pt	33398 05	33323 00	33323 00	34235 21	34235 21	34232 56	34434 35	34434 35	34434 36 pt
			33398 73	33398 73	33399 85	34235 22	34235 22	34232 58	34434 37	34434 37	34434 38 pt
33157 22	33157 22	33157 31 pt 33157 61 pt 33157 71 pt	33398 99	33398 99	33398 23 33398 98 33399 81	34235 31	34235 31 35533 81	34232 99 pt 35531 85 pt 35532 81 pt	34434 39	34434 39	34434 40 pt
33157 23	33157 23	33157 31 pt 33157 61 pt 33157 71 pt	33416 99	33416 99	33416 51 33416 98	34235 33	34235 33 35533 83	34232 99 pt 35531 85 pt 35532 81 pt	34434 41	34434 41	34434 42 pt
33157 41	33157 41	33157 31 pt 33157 61 pt 33157 71 pt	33542 61	33542 61	33542 51 pt 33542 53 pt	34235 39	34235 39 35533 84	34232 99 pt 35531 85 pt 35532 81 pt	34434 43	34434 43	34434 44 pt
			33542 63	33542 63	33542 51 pt 33542 53 pt	34236 11	34236 11	34233 11	34434 45	34434 45	34434 46 pt
33157 42	33157 42	33157 31 pt 33157 61 pt	33561 66	33561 66	33569 92				34434 47	34434 47	34434 48 pt

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1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
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34435 21 34435 23	34435 21 34435 23	34435 20	34464 10	34464 10	34460 54 pt 34460 56 pt	34913 59	3494A 47	3494A 47	34932 10 34932 20	34932 10 34932 20	34932 00
34435 31 34435 33	34435 31 34435 33	34435 35	34464 13	34464 13	34460 54 pt 34460 56 pt	34913 61	3494A 49	3494A 49	34944 21	34944 21	34944 11
34435 37 34435 39	34435 37 34435 39	34435 38	34464 16	34464 16	34460 54 pt 34460 56 pt	34914 11	3494A 51	3494A 51	34944 31 34944 41 34944 51 34944 99	34944 31 34944 41 34944 51 34944 99	34944 19
34438 03 34438 05	34438 03 34438 05	34438 04	34464 18	34464 18	34460 54 pt 34460 56 pt	34914 13	3494A 52	3494A 52	34945 12 34945 14 34945 16 34945 17 34945 99	34945 12 34945 14 34945 16 34945 17 34945 99	34945 98
34438 14 34438 16	34438 14 34438 16	34438 15	34465 10	34465 10	34460 54 pt	34914 15	3494A 53	3494A 53	34961 22 34961 31	34961 22 34961 31	34961 21
34438 17 34438 19	34438 17 34438 19	34438 18	34465 12	34465 12	34460 56 pt	34914 17	3494A 54	3494A 54	34964 41	34964 41	34964 31 pt 34964 61 pt 34964 71 pt 34964 99 pt
34439 15 34439 17 34439 19	34439 15 34439 17 34439 19	34439 21	34465 30	34465 30	34460 62	34914 21	3494A 55	3494A 55	34964 43	34964 43	34964 31 pt 34964 61 pt 34964 71 pt 34964 99 pt
34439 31 34439 32 34439 33 34439 34	34439 31 34439 32 34439 33 34439 34	34439 30	34482 11	34482 11	34482 17 34482 27	34914 23	3494A 56	3494A 56	34964 45	34964 45	34964 31 pt 34964 61 pt 34964 71 pt 34964 99 pt
34439 51 34439 53	34439 51 34439 53	34439 56	34625 11 34625 13 34625 15 34625 17	34625 11 34625 13 34625 15 34625 17	34625 00	34914 25	3494A 57	3494A 57	34964 51	34964 51	34964 31 pt 34964 61 pt 34964 71 pt 34964 99 pt
34441 21	34441 21	34446 37	34626 11 34626 13 34626 15 34626 17	34626 11 34626 13 34626 15 34626 17	34626 00	34914 31	3494A 58	3494A 58	34966 23 34966 25	34966 23 34966 25	34966 13
34441 23	34441 23	34446 36	34627 11 34627 13 34627 15 34627 17	34627 11 34627 13 34627 15 34627 17	34627 00	34915 11	3494A 61	3494A 61	34966 27 34966 29	34966 27 34966 29	34966 21
34441 27	34441 27	34446 34	34628 11 34628 13 34628 15 34628 17	34628 11 34628 13 34628 15 34628 17	34628 00	34915 23	3494A 63	3494A 63	34968 45 34968 46 34968 47	34968 45 34968 46 34968 47	34968 49
34441 29	34441 29	34446 32	34692 20 34692 88 34692 98	34692 20 34692 88 34692 98	34692 99	34915 35	3494A 65	3494A 65	34968 81 34968 83 34968 85	34968 81 34968 83 34968 85	34968 98
34443 11 34443 13	34443 11 34443 13	34446 21	34696 00 34699 98	34696 00 34699 98	34699 99	34916 11	3494A 31	3494A 31	34992 13	34992 13	34992 12 34992 19
34443 21 34443 23	34443 21 34443 23	34446 25	34790 10 34790 11 34790 21	34790 10 34790 11 34790 21	34790 19	34916 13	3494A 33	3494A 33	34995 21	34995 21	34995 13 34995 15
34447 21	34447 21	34446 47	34790 73 34790 75	34790 73 34790 75	34790 71	34916 15	3494A 34	3494A 34	34995 31 34995 39	34995 31 34995 39	34995 19
34447 25	34447 25	34446 46	34911 11	3494A 11	3494A 11	34916 17	3494A 35	3494A 35	34998 25 34998 99	34998 25 34998 99	34998 98
34447 31	34447 31	34446 11	34911 21	3494A 12	3494A 12	34916 53	3494A 36	3494A 36	35111 01 35111 02	35111 01 35111 02	35111 00
34447 41	34447 41	34446 51	34911 23	3494A 13	3494A 13	34916 55	3494A 37	3494A 37	35112 00	35112 00	35112 00 pt
34448 11	34448 11	34446 62 pt	34911 34	3494A 14	3494A 14	34916 57	3494A 38	3494A 38	35112 21	35112 21	35112 01 pt 35112 15 35112 16
34448 13 34448 19	34448 13 34448 19	34446 64 pt	34911 38	3494A 15	3494A 15	34916 77	3494A 71	3494A 71	35112 22	35112 22	35112 01 pt 35112 17
34449 31	34449 31	34446 15	34911 43	3494A 17	3494A 17	34916 79	3494A 75	3494A 75	35112 23	35112 23	35112 08 35112 18
34449 41	34449 41	34446 62 pt 34446 64 pt	34911 52	3494A 19	3494A 19	34916 98	3494A 98	3494A 98	35112 24	35112 24	35112 09 35112 19
34449 53	34449 53	34446 44	34912 01	3494A 21	3494A 21	34917 11	34949 11	34949 11			
34449 55	34449 55	34446 42	34912 11	3494A 22	3494A 22	34917 13	34949 13	34949 13			
34449 62	34449 62	34446 62 pt	34912 21	3494A 23	3494A 23	34917 15	34949 15	34949 15			
34449 65	34449 65	34446 64 pt	34912 31	3494A 25	3494A 25	34917 27	34949 27	34949 21 34949 23 34949 25			
34449 98	34449 98	34446 98	34912 35	3494A 26	3494A 26	34917 31	34949 31	34949 31			
34461 10	34461 10	34460 07	34912 41	3494A 27	3494A 27	34917 39	34949 39	34949 39			
34461 12	34461 12	34460 09	34912 43	3494A 29	3494A 29	34917 98	34949 98	34949 98			
34461 15	34461 15	34460 12	34912 44	3494A 30	3494A 30	34918 00	34947 00	34947 00			
34461 17	34461 17	34460 17	34912 51	3494A 31	3494A 31	34919 00	34948 00	34948 00			
34462 10	34462 10	34460 31	34912 52	3494A 32	3494A 32	34921 00	3494B 00	3494B 00			
34462 12	34462 12	34460 36	34912 53	3494A 33	3494A 33	34922 00	3494C 00	3494C 00			
34462 22	34462 22	34460 22	34912 55	3494A 35	3494A 35	34923 00	3494D 00	3494D 00			
34462 26	34462 26	34460 51	34912 57	3494A 37	3494A 37	34924 00	3494E 00	3494E 00			
34463 10	34463 10	34460 41	34912 59	3494A 39	3494A 39	34925 00	3494F 00	3494F 00			
			34913 11	3494A 39	3494A 39	34926 00	3494G 00	3494G 00			
			34913 23	3494A 43	3494A 43	34927 00	3494H 00	3494H 00			

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1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
35112 74	35112 74	35112 75 pt	3531E 00	3531E 00	35314 00 pt	35337 22 35337 23	35337 22 35337 23	35331 41	35364 03	35364 03	35362 09 35362 15 pt
35112 76	35112 76	35112 75 pt 35112 77	3531F 00	3531F 00	35316 00	35337 24 35337 25	35337 24 35337 25	35331 46	35364 04	35364 04	35362 11 35362 15 pt
35112 79 35112 83	35112 79 35112 83	35112 00 pt	3531G 00	3531G 00	35318 00 pt	35337 26 35337 27	35337 26 35337 27	35331 43	35364 05	35364 05	35362 13 35362 15 pt
35199 01	35199 01	35199 98 pt	3531H 00	3531H 00	35313 00 pt 35318 00 pt 35319 85	35337 44	35337 44	35331 44	35364 06	35364 06	35362 14 35362 15 pt
35199 33	35199 26	35199 26	3531K 06	3531K 06	35319 06	35337 45	35337 45	35331 45	35364 17	35364 17	35362 55 pt
35199 41 35199 42	35199 41 35199 42	35199 03	3531K 07	3531K 07	35319 07	35337 47	35337 47	35331 47	35364 52	35364 52	35362 52
35199 43 35199 44	35199 43 35199 44	35199 04	3531K 11	3531K 11	35319 11	35337 48	35337 48	35331 48	35364 54	35364 54	35362 55 pt
35199 45 35199 46	35199 45 35199 46	35199 05	3531K 20	3531K 20	35319 20	35337 59	35337 59	35331 59	35373 01 35373 02	35373 01 35373 02	35371 23 pt
35199 47	35199 47	35199 06 pt 35199 07 pt	3531K 21	3531K 21	35319 21	35337 61	35337 61	35332 61 pt	35373 03	35373 03	35371 11 pt
35199 48	35199 48	35199 06 pt 35199 07 pt	3531K 22 3531K 24	3531K 22 3531K 24	35319 23	35338 31	35338 31	35332 31	35373 05	35373 05	35371 36 pt 35371 37 pt 35371 38 pt
35199 51 35199 52	35199 51 35199 52	35199 14	3531K 25	3531K 25	35319 25	35338 51	35338 51	35332 51	35373 06	35373 06	35371 36 pt 35371 37 pt 35371 38 pt
35199 53 35199 54	35199 53 35199 54	35199 15	3531K 27	3531K 27	35319 27	35338 55	35338 55	35332 55	35373 08	35373 08	35371 11 pt
35199 55 35199 56	35199 55 35199 56	35199 16	3531K 53 3531K 55	3531K 53 3531K 55	35319 52	35338 98	35338 98	35332 98	35373 12	35373 12	35371 61
35199 57 35199 58	35199 57 35199 58	35199 17	3531K 61	35363 36	35361 36	35338 99	35338 99	35332 61 pt	35373 15	35373 15	35371 23 pt 35371 41 pt
35199 59 35199 60	35199 59 35199 60	35199 18	3531K 70	3531K 70	35319 70	35339 12	35339 12	35333 12	35373 16	35373 16	35371 11 pt
35199 61 35199 62	35199 61 35199 62	35199 19	3531K 74	3531K 74	35319 72 35319 73	35339 13	35339 13	35333 13	35373 17	35373 17	35371 36 pt 35371 37 pt 35371 41 pt
35199 91	35199 91	35199 22 pt 35199 23 pt 35199 28 pt 35199 29 pt 35199 98 pt	3531K 77	3531K 77	35319 75 35319 76	35339 14	35339 14	35333 14	35373 18	35373 18	35371 11 pt
35199 92	35199 92	35199 22 pt 35199 23 pt 35199 28 pt 35199 29 pt 35199 98 pt	3531K 82	3531K 82	35319 82	35339 19	35339 19	35333 19	35373 19	35373 19	35371 65
35239 26	35239 26	35239 21 35239 25	3531K 90	3531K 40 35373 90	35319 41 35371 91 35371 93	35339 21	35339 21	35333 21	35373 21	35373 21	35371 55
35239 31	35239 31	35239 01 35239 02 35239 03 35239 04 35239 05 35239 06 35239 07 35239 08 35239 09 35239 11 35239 12 35239 19 35239 30	3531K 97	3531K 97	35319 97	35339 53	35339 53	35333 53	35373 25	35373 25	35371 99 pt
35239 53	35239 53	35239 50 35239 51	3531M 01	3531M 01	35313 00 pt	35339 55	35339 55	35333 55	35373 26	35373 26	35371 75
3523C 00	3523C 00	35234 00 pt 35237 00 35238 00 pt	3531M 03	3531M 03	35314 00 pt	35339 57	35339 57	35333 57	35373 28	35373 28	35371 81
3523E 00	3523E 00	35234 00 pt 35238 00 pt	3531M 05	3531M 05	35319 84 pt 35319 86 pt	35339 61	35339 61	35333 61	35373 29	35373 29	35371 83
3523F 00	3523F 00	3523A 00 3523B 00	3531M 07	3531M 07	35319 84 pt 35319 86 pt	35339 65	35339 65	35333 65	35373 31	35373 31	35371 71
35246 00	35246 00	35243 00 35245 00	3531M 09	3531M 09	35319 84 pt 35319 86 pt	35339 71	35339 71	35333 71	35373 32	35373 32	35371 85
3531A 00	3531A 00	35311 00	3531M 15	3531M 19	35319 84 pt 35319 86 pt 35374 15 35372 85 pt	35339 82	35339 82	35333 82	35373 35	35364 41	35362 41
3531B 00	3531B 00	35312 00	35329 33	35329 33	35329 31 pt 35329 35 pt	35339 88	35339 88	35333 88	35373 39	35373 39	35371 48 35371 99 pt
3531C 00	3531C 00	35317 10 35317 20 35317 30	35329 34	35329 34	35329 31 pt 35329 35 pt	35339 98	35339 98	35333 98	35374 11	35374 11	35372 11
			35329 37 35329 38 35329 41 35329 43	35329 37 35329 38 35329 41 35329 43	35329 39	35363 01 35363 02 35363 03	35363 01 35363 02 35363 03	35361 11	35374 17	35364 57	35362 57
			35329 71 35329 73 35329 75	35329 71 35329 73 35329 75	35329 79	35363 13	35363 13	35361 13	35374 19	35374 19	35372 85 pt
			35337 11	35337 11	35331 11	35363 15	35363 15	35361 14	35419 21 35419 22 35419 23 35419 24 35419 25 35419 26	35419 21 35419 22 35419 23 35419 24 35419 25 35419 26	35419 41
			35337 12	35337 12	35331 12	35363 16	35363 16	35361 16	3541D 00	3541D 00	35411 00 35412 00
			35337 14	35337 14	35331 14	35363 32	35363 32	35361 33 35361 39 pt	35421 00	35421 00	35421 10 35421 20
			35337 15	35337 15	35331 15	35363 37 35363 38	35363 37 35363 38	35361 39 pt	35424 01 35424 02	35424 01 35424 02	35424 11
			35337 16	35337 16	35331 16	35363 45	35363 45	35361 45	35424 03 35424 04 35424 05	35424 03 35424 04 35424 05	35424 75
			35337 17	35337 17	35331 17	35364 01	35364 01	35362 07 35362 15 pt	35430 11	35650 11	35650 11
			35337 21	35337 21	35331 21	35364 02	35364 02	35362 08 35362 15 pt			

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35430 98	35650 98	35650 98	35462 72	35462 72	35462 73 35462 74 35462 75 35462 76 35462 77 35462 78	35484 09	35496 19	35496 19	35543 03	35543 03	35541 28 pt 35542 73 pt
35441 23 35441 25	35441 23 35441 25	35441 29			35485 01	35497 61	35497 61	35543 04	35543 04	35541 25 35542 73 pt	
35441 42 35441 44 35441 83 35441 89	35441 42 35441 44 35441 83 35441 89	35441 91			35485 02	35497 65	35497 65				
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35442 16	35442 16	35442 25 pt	35481 01	36231 14	36231 14	35485 04	35497 73	35497 73	35543 09	35543 09	35541 31 35542 73 pt
35442 17 35442 18 35442 19 35442 23	35442 17 35442 18 35442 19 35442 23	35442 62 pt				35485 05	35497 74	35497 63 35497 75	35543 11	35543 11	35541 49 pt 35542 73 pt
35442 41 35442 42	35442 41 35442 42	35442 33				35485 07	35495 55	35495 55			
35442 45 35442 47 35442 67	35442 45 35442 47 35442 67	35442 62 pt				35481 02	36231 16	36231 16	35485 09	35497 81	35497 81	35543 12	35543 12	35541 49 pt 35542 73 pt
35451 53	35451 53	35451 43 35451 44	35481 03	36231 31	36231 31	35492 13 35492 18	35492 13 35492 18	35492 19	35543 13	35543 13	35541 45 35542 73 pt
35451 54	35451 54	35451 48 35451 49	35481 04	36231 32	36231 32	35495 01 35495 02 35495 03	35495 01 35495 02 35495 03	35495 10	35543 14	35543 14	35541 49 pt 35542 73 pt
35454 12	35454 12	35453 12	35481 05	36231 33	36231 33	35495 92 35495 95	35495 92 35495 95	35495 98	35543 15	35543 15	35541 41 35541 43 35541 49 pt 35542 73 pt
35454 14	35454 14	35453 14	35481 07	36231 52	36231 52	35521 38	35521 38	35521 42 35521 47	35543 21	35543 21	35541 59 pt 35542 73 pt
35454 17	35454 17	35453 17	35481 08	36231 53	36231 53	35521 39	35521 39	35521 46 35521 48			
35454 31	35454 31	35453 31	35481 09	36231 54	36231 54	35521 54 35521 56	35521 54 35521 56	35521 55	35543 22	35543 22	35541 51 35542 73 pt
35454 37	35454 37	35453 37	35481 11	36231 56	36231 56	35521 68 35521 69	35521 68 35521 69	35521 67	35543 23	35543 23	35541 53 35542 73 pt
35454 38	35454 38	35453 38	35481 12	36231 57	36231 57	35521 84 35521 85	35521 84 35521 85	35521 86	35543 24	35543 24	35541 54 pt 35541 59 pt 35542 73 pt
35454 41	35454 41	35453 41	35481 19	36231 59	36231 59	35522 79	35522 79	35522 72 35522 99			
35454 43	35454 43	35453 43	35482 01 35482 02	36232 01 36232 02	36232 41	35533 11	35533 11	35531 11	35543 25	35543 25	35541 54 pt 35541 59 pt 35542 73 pt
35454 45	35454 45	35453 45	35482 03	36232 11	36232 11	35533 13	35533 13	35531 13	35543 26	35543 26	35541 56 35541 59 pt 35542 73 pt
35454 51	35454 51	35453 51	35482 04	36232 23	36232 23	35533 15	35533 15	35531 15	35544 01	35544 01	35542 89
35454 59	35454 59	35453 59	35482 05	36232 25	36232 25	35533 19	35533 19	35531 62	35544 02	35544 02	35542 83
35455 11	35455 11	35452 11	35482 06	36232 31	36232 31	35533 21 35533 23	35533 21 35533 23	35531 73 pt	35544 03 35544 04	35544 03 35544 04	35542 85
35455 13	35455 13	35452 13	35482 07	36232 43	36232 59 pt 36232 64 pt	35533 25 35533 27	35533 25 35533 27	35531 75 pt	35544 05	35544 05	35542 87
35455 15	35455 15	35452 15	35482 08	36232 45	36232 59 pt 36232 64 pt 36232 68 pt	35533 29	35533 29	35531 98 pt	35551 02	35551 02	35551 01 35551 03 35551 05 35551 08
35455 17	35455 17	35452 17	35482 11	36232 52	36232 52	35533 31	35533 31	35531 73 pt	35553 05	35553 05	35553 01 35553 02 35553 04
35455 21	35455 21	35452 21	35482 12	36232 54	36232 54	35533 33	35533 33	35531 75 pt			
35455 61	35455 61	35452 61	35482 13	36232 55	36232 55	35533 35 35533 37	35533 35 35533 37	35531 98 pt	35553 08	35553 08	35553 11 35553 12
35455 65	35455 65	35452 65	35482 14	36232 58	36232 58	35533 39	35533 39	35531 17 35531 73 pt 35531 75 pt 35531 98 pt	35553 09	35553 09	35553 45 35553 52 35553 57
35455 71	35455 71	35452 71	35482 15	36232 62	36232 61 36232 65	35533 87	35533 87	35531 87	35558 02 35558 09	35558 02 35558 09	35557 01
35455 81 35455 83	35455 81 35455 83	35452 99 pt	35482 16	36232 66	36232 64 pt 36232 68 pt	35534 01 35534 02 35534 03	35534 01 35534 02 35534 03	35532 21	35558 69	35558 69	35557 69
35455 91 35455 92	35455 91 35455 92	35452 92	35483 05	36233 13	36233 13	35534 04 35534 05 35534 06 35534 07 35534 08 35534 09	35534 04 35534 05 35534 06 35534 07 35534 08 35534 09	35532 98	35558 83	35558 83	35557 83
35455 93	35455 93	35452 99 pt	35483 06	36233 23	36233 23	35534 11	35534 11	35532 81 pt	35558 85	35558 85	35557 85
35455 94	35455 94	35452 94	35483 07	36233 31	36233 31	35543 01	35543 01	35541 11 35542 73 pt	35558 87	35558 87	35557 87
35455 95	35455 95	35452 95	35483 08	36233 52	36233 52	35543 02	35543 02	35541 21 35541 27 35542 73 pt	35558 89	35558 89	35557 89
35455 96 35455 97 35455 98	35455 96 35455 97 35455 98	35452 99 pt	35483 09	36233 61	36233 61	35543 03	35543 03	35541 21 35542 73 pt	35558 99	35558 99	35557 99
35462 42 35462 44	35462 42 35462 44	35462 43	35484 01	35496 01	35496 01	35543 04	35543 04	35541 21 35541 27 35542 73 pt	35561 02	35561 02	35561 41 pt 35561 99 pt
35462 47	35462 47	35462 45 35462 49	35484 02	35496 05	35496 05	35543 05	35543 05	35541 21 35541 27 35542 73 pt	35561 05	35561 05	35561 73
			35484 03	35496 09	35496 09	35543 06	35543 06	35541 21 35541 27 35542 73 pt	35561 06	35561 06	35561 83

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35561 07	35511 07	35511 91	35593 01	35593 11	35593 11	35599 13	35599 13	35595 41 pt 35595 98 pt	35616 00	35616 00	3561C 00
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35561 09	35511 09	35511 41 pt	35593 05	35593 32	35593 32				35646 10 35646 20	35646 10 35646 20	35646 00
35561 11 35561 19 35561 21	35511 11 35511 19 35511 21	35511 99 pt	35593 07	35593 34	35593 34	35599 17	35599 17	35595 41 pt 35595 98 pt	35651 01	35514 15 35691 15	35514 15 35691 15
35562 11	35512 11	35512 11	35593 09	35593 35	35593 35	35599 19	35599 19	35595 41 pt 35595 98 pt	35651 02	35514 22 35691 22	35514 22 35691 22
35562 21	35512 21	35512 21	35593 11	35593 52	35593 52						
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35562 41	35512 41	35512 41	35593 15	35593 61	35593 61	35599 25	35599 25	35595 41 pt 35595 98 pt			
35562 51	35512 51	35512 51	35593 17	35593 71	35593 71	35599 27	35599 27	35595 41 pt 35595 98 pt	35651 04	35514 29 35691 29	35514 29 35691 29
35562 65	35512 65	35512 61 35512 92 pt	35593 19	35593 72	35593 72						
35562 71	35512 71	35512 71	35593 21 35593 23 35593 25	35593 21 35593 23 35593 25	35593 79	35599 31 35599 33	35599 31 35599 33	35595 45	35651 05	35514 30 35691 30	35514 30 35691 30
35562 75	35512 75	35512 75	35593 27 35593 28 35593 29	35593 27 35593 28 35593 29	35593 81	35599 35 35599 37	35599 35 35599 37	35595 49	35651 06	35514 32 35691 32	35514 32 35691 32
35562 85	35512 85	35512 92 pt	35594 01	35594 11	35594 11	35599 39 35599 41	35599 39 35599 41	35595 43			
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35563 01	35513 01	35513 59 pt	35594 05	35594 51	35594 51	35599 47	35599 47	35595 85 pt			
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35563 07	35513 07	35513 59 pt	35596 07 35596 09 35596 11	35596 07 35596 09 35596 11	35599 61 35599 63	35599 61 35599 63	35599 61 35599 63	35595 96	35651 14	35514 55 35691 55	35514 55 35691 55
35563 08	35513 08	35513 49	35596 13 35596 15 35596 17 35596 19	35596 13 35596 15 35596 17 35596 19							
35563 09	35513 09	35513 59 pt	35596 21 35596 23 35596 25	35596 21 35596 23 35596 25	35599 65	35599 65	35599 65	35595 82 pt	35651 15	35514 63 35691 63	35514 63 35691 63
35563 11	35513 11	35513 13	35596 27 35596 29 35596 31	35596 27 35596 29 35596 31							
35563 12	35513 12	35513 23 pt 35513 59 pt	35596 33 35596 35 35596 37 35596 39	35596 33 35596 35 35596 37 35596 39	35599 67	35599 67	35599 67	35595 86 pt	35651 16	35514 71 35691 71	35514 71 35691 71
35563 14	35513 14	35513 59 pt	35596 41 35596 43 35596 45	35596 41 35596 43 35596 45							
35563 15	35513 15	35513 29 35513 59 pt	35596 47 35596 49 35596 51	35596 47 35596 49 35596 51	35599 69	35599 69	35599 69	35595 83 pt 35595 84 pt	35651 17	35514 81 35691 81	35514 81 35691 81
35563 21	35513 21	35513 83 pt	35596 53 35596 55 35596 57 35596 59	35596 53 35596 55 35596 57 35596 59							
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35591 07	35591 07 35698 33	35591 00 pt 35699 97 pt	35596 67 35596 69 35596 71	35596 67 35596 69 35596 71							
35591 09 35591 11	35591 09 35591 11	35591 00 pt	35596 73 35596 75 35596 77 35596 79	35596 73 35596 75 35596 77 35596 79	35599 73 35599 75	35599 73 35599 75	35599 73 35599 75	35595 87	35651 19	35514 83 35691 83	35514 83 35691 83
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35591 15	35591 15	35591 00 pt	35596 87 35596 89 35596 91	35596 87 35596 89 35596 91	35599 77 35599 79	35599 77 35599 79	35599 77 35599 79	35595 94	35651 20	35514 84 35691 84	35514 84 35691 84 pt
35592 01	35592 21	35592 21	35596 93 35596 95 35596 97	35596 93 35596 95 35596 97							
35592 03	35592 33	35592 33	35596 99 35599 01 35599 03	35596 99 35599 01 35599 03	35599 80 35599 81	35599 80 35599 81	35599 80 35599 81	35595 98 pt	35651 21	35514 85 35691 85	35513 67 35691 84 pt
35592 05	35592 35	35592 35	35599 05 35599 07	35599 05 35599 07							
35592 07	35592 54	35592 54	35599 09 35599 11	35599 09 35599 11	35599 82 35599 83	35599 82 35599 83	35599 82 35599 83	35595 62 pt	35651 22	35514 91 35691 91	35513 83 pt 35514 91 35691 91
35592 09 35592 11	35592 09 35592 11	35592 98 pt	35599 01 35599 03	35599 01 35599 03							
35592 15	35592 15	35592 41 35592 42 35592 98 pt	35599 05 35599 07	35599 05 35599 07	35599 84 35599 85 35599 86 35599 87	35599 84 35599 85 35599 86 35599 87	35599 84 35599 85 35599 86 35599 87	35595 98 pt	35651 23	35514 92 35691 92	35514 92 35691 92
35592 19	35592 97	35592 97	35599 09 35599 11	35599 09 35599 11							
			35599 01 35599 03	35599 01 35599 03	35595 11	35599 92 35599 93 35599 94 35599 95 35599 96 35599 97	35599 92 35599 93 35599 94 35599 95 35599 96 35599 97	35595 98 pt	35674 01	35674 01	35674 11 pt
			35599 05 35599 07	35599 05 35599 07	35595 21	35599 98 35599 99	35599 98 35599 99	35595 88 35595 98 pt	35674 02	35674 02	35674 17
			35599 09 35599 11	35599 09 35599 11	35595 32	35599 92 35599 93 35599 94 35599 95 35599 96 35599 97	35599 92 35599 93 35599 94 35599 95 35599 96 35599 97	35595 98 pt	35674 03	35674 03	35674 19 pt 35674 31 pt
			35599 01 35599 03	35599 01 35599 03	35595 11	35599 92 35599 93 35599 94 35599 95 35599 96 35599 97	35599 92 35599 93 35599 94 35599 95 35599 96 35599 97	35595 98 pt	35674 04	35674 04	35674 11 pt 35674 19 pt 35674 31 pt
			35599 05 35599 07	35599 05 35599 07	35595 21	35599 92 35599 93 35599 94 35599 95 35599 96 35599 97	35599 92 35599 93 35599 94 35599 95 35599 96 35599 97	35595 98 pt	35675 01	35675 01	35675 51
			35599 09 35599 11	35599 09 35599 11	35595 32	35599 92 35599 93 35599 94 35599 95 35599 96 35599 97	35599 92 35599 93 35599 94 35599 95 35599 96 35599 97	35595 98 pt	35675 02 35675 03	35675 02 35675 03	35675 59
			35599 05 35599 07	35599 05 35599 07	35595 21	35599 92 35599 93 35599 94 35599 95 35599 96 35599 97	35599 92 35599 93 35599 94 35599 95 35599 96 35599 97	35595 98 pt	35675 11 35675 12	35675 11 35675 12	35675 91
			35599 09 35599 11	35599 09 35599 11	35595 32	35599 92 35599 93 35599 94 35599 95 35599 96 35599 97	35599 92 35599 93 35599 94 35599 95 35599 96 35599 97	35595 98 pt	35676 00	35676 00	35672 00 pt
			35599 09 35599 11	35599 09 35599 11	35595 32	35599 92 35599 93 35599 94 35599 95 35599 96 35599 97	35599 92 35599 93 35599 94 35599 95 35599 96 35599 97	35595 98 pt	35676 01	35676 01	35672 11

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35676 02	35676 02	35672 21	35751 00	35732 40 36612 10	35732 00 pt 36612 00 pt	35892 98	35892 98	35892 89 pt	35963 03	35763 03	35760 62
35676 03	35676 03	35672 61	35752 00	35733 40	35734 30 pt 35735 51 pt	35892 99	35892 99	35892 93 pt	35963 05	35763 05	35760 63
35676 04	35676 04	35672 00 pt				35893 01 35893 02	35893 01 35893 02	35893 11	35963 09	35763 09	35760 84
35676 05	35676 05	35672 41 pt	35771 00	35732 30 35732 61	35732 00 pt	35893 08 35893 09	35893 08 35893 09	35893 98	36122 02 36122 04 36122 06 36122 14 36122 16 36122 19 36122 21 36122 23 36122 28 36122 29	36122 02 36122 04 36122 06 36122 14 36122 16 36122 19 36122 21 36122 23 36122 28 36122 29	36122 00
35676 06	35676 06	35672 00 pt	35772 00	35733 30 35733 60	35734 30 pt 35735 51 pt 35734 30 pt 35735 51 pt	35921 01	35921 01	35921 11	36122 32 36122 33 36122 37 36122 39 36122 41 36122 42 36122 43 36122 44	36122 32 36122 33 36122 37 36122 39 36122 41 36122 42 36122 43 36122 44	36125 00 pt
35676 17 35676 19	35676 17 35676 19	35672 41 pt				35921 02	35921 02	35921 13				35921 03	35921 03	35921 71
35681 11 35681 13	35681 11 35681 13	35681 15	35781 00	35743 00	35743 00	35921 05	35921 05	35921 72	36126 01 36126 02 36126 03 36126 04 36126 05 36126 09	36126 01 36126 02 36126 03 36126 04 36126 05 36126 09	36125 00 pt
35683 36 35683 93 35683 95	35683 36 35683 93 35683 95	35683 99 pt	35782 00	35744 00	35744 00	35922 01	35922 01	35922 21			
35683 98	35683 98	35683 91 35683 99 pt	3579A 00	3579A 00	3579A 20 3579A 40 3579A 41 3579A 44 3579A 50 3579A 55	35922 02	35922 02	35922 23	36127 11 36127 31 36127 78	36127 11 36127 31 36127 78	36127 00
35692 00	35692 00	35694 00 35695 00 35696 00				35922 03	35922 03	35922 51				35922 04	35922 04	35922 53
35693 04	35693 04	35693 01 pt 35693 02 pt 35693 03 pt	35820 35 35820 36	35820 35 35820 36	35820 24	35922 05	35922 05	35922 55	36249 94 36249 96	36249 94 36249 96	36249 98
35693 05	35693 05	35693 01 pt 35693 02 pt 35693 03 pt	35856 00	35856 00	35856 11 35856 30	35922 06	35922 06	35922 57				36251 00	36138 10 36794 00	36138 00 pt 36794 00
35693 06	35693 06	35693 01 pt 35693 02 pt 35693 03 pt	35859 05 35859 07	35859 05 35859 07	35859 09	35922 09	35922 09	35922 59	36252 00	36221 00	36221 00
35697 00	35697 00	35699 97 pt	3585C 00	3585A 10 3585A 20 36993 00	3585A 10 3585A 20 36993 00	35923 01	35923 01	35923 61				36253 00	36222 00	36222 00
35698 01 35698 02	35698 01 35698 02	35699 31	3585D 10	3585B 10	3585B 10	35923 02	35923 02	35923 63	36254 00	36138 20 36223 00	36138 00 pt 36223 00
35698 03 35698 04	35698 03 35698 04	35699 32	3585D 20	3585B 20	3585B 20	35931 00	35991 00	35996 00 35997 00				36291 01	36291 11	36291 11
35698 05 35698 06	35698 05 35698 06	35699 33	3585D 30	3585B 30	3585B 30	35932 00	35998 00	35998 00	36291 03	36291 31	36291 31
35698 07 35698 08	35698 07 35698 08	35699 35	3585D 40	3585B 40	3585B 40	35941 10	35619 00	35617 00 35618 00				36291 05	36291 05	36291 35 36291 98 pt
35698 09 35698 10	35698 09 35698 10	35699 36	3585D 50	3585B 50	3585B 50	35942 10	3561D 00	3561A 00 3561B 00	36291 09	36291 09	36291 98 pt
35698 11 35698 12	35698 11 35698 12	35699 37	3585D 60	3585B 60	3585B 60	35942 20	35631 60	35631 40 pt				36293 01	36293 01	36293 13 36293 15
35698 13 35698 14	35698 13 35698 14	35699 41	3585D 70	3585B 70	3585B 70	35961 01	35761 01	35760 13	36311 10 36311 20	36311 10 36311 20	36311 00
35698 15 35698 16	35698 15 35698 16	35699 43	3585D 80	3585B 72 36994 07	3585B 72 36994 07	35961 03	35761 03	35760 15				36313 10 36313 20	36313 10 36313 20	36313 00
35698 17 35698 18	35698 17 35698 18	35699 45	35860 89	35860 89	35860 21 35860 41 35860 88	35961 05	35761 05	35760 21	36314 10 36314 20	36314 10 36314 20	36314 00
35698 19 35698 20	35698 19 35698 20	35699 46	35892 03	35892 03	35892 01 pt	35961 07	35761 07	35760 23				36330 10	36330 10	36331 00 36333 11 36333 15 36333 71
35698 21 35698 22	35698 21 35698 22	35699 51	35892 04 35892 05	35892 04 35892 05	35892 02 pt	35961 09	35761 09	35760 24	36330 20	36330 20	36333 95
35698 23 35698 24	35698 23 35698 24	35699 61	35892 06	35892 06	35892 01 pt 35892 02 pt	35961 11	35761 11	35760 26				36349 20	36349 20	36349 13 36349 18 36349 88 36349 89
35698 25 35698 26	35698 25 35698 26	35699 71	35892 07	35892 07	35892 93 pt	35961 13	35761 13	35760 28	36349 20	36349 20	36349 13 36349 18 36349 88 36349 89
35698 27 35698 28	35698 27 35698 28	35699 73	35892 26	35892 26	35892 25 35892 28	35961 15	35761 15	35760 22				36349 20	36349 20	36349 13 36349 18 36349 88 36349 89
35698 29 35698 30	35698 29 35698 30	35699 74	35892 27	35892 27	35892 93 pt	35961 17	35761 17	35760 30	36349 20	36349 20	36349 13 36349 18 36349 88 36349 89
35698 31 35698 32	35698 31 35698 32	35699 75	35892 43	35892 43	35892 61 35892 89 pt	35962 01	35762 01	35760 32				36349 20	36349 20	36349 13 36349 18 36349 88 36349 89
35698 33 35698 34	35698 33 35698 34	35699 76	35892 44	35892 44	35892 89 pt	35962 03	35762 03	35760 33	36349 20	36349 20	36349 13 36349 18 36349 88 36349 89
35698 35 35698 36	35698 35 35698 36	35699 77	35892 45 35892 76	35892 45 35892 76	35892 93 pt	35962 05	35762 05	35760 36				36349 20	36349 20	36349 13 36349 18 36349 88 36349 89
35711 00	35731 00 36629 43	35731 00 36629 00 pt	35892 77 35892 78 35892 79	35892 77 35892 78 35892 79	35892 84	35962 07	35762 07	35760 37 pt	36349 20	36349 20	36349 13 36349 18 36349 88 36349 89
35712 00	35733 05	35734 20 35735 41	35892 80	35892 80	35892 93 pt	35962 09	35762 09	35760 41				36349 20	36349 20	36349 13 36349 18 36349 88 36349 89
35721 00	35732 10	35732 00 pt	35892 85 35892 87 35892 88	35892 85 35892 87 35892 88	35892 86	35962 11	35762 11	35760 45	36349 20	36349 20	36349 13 36349 18 36349 88 36349 89
35722 00	35733 10	35734 30 pt 35735 51 pt	35892 91	35892 91	35892 93 pt	35962 13	35762 13	35760 52				36349 20	36349 20	36349 13 36349 18 36349 88 36349 89
						35962 15	35762 15	35760 53	36349 20	36349 20	36349 13 36349 18 36349 88 36349 89
						35962 17 35962 19	35762 17 35762 19	35760 37 pt			
						35963 01	35763 01	35760 61			

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36395 10	36361 21 36395 30	36361 21 36394 00 pt 36399 60	36920 05— Con.	36920 05— Con.	36920 10 pt —Con. 36920 82 pt 36920 92 pt	37112 02— Con.	37112 02— Con.	37112 23 pt —Con. 37112 26 pt	37131 07	37131 07	37131 60 pt
									37131 11	37131 40	37131 40
36395 20	36361 84 36395 40	36361 84 36394 00 pt 36399 91 36399 93		36920 07	36920 10 pt 36920 70 pt 36920 82 pt 36920 92 pt	37112 03	37112 03	37112 11 pt 37112 13 pt	37131 13	37131 13	37131 42 37131 46
						37112 04	37112 04	37112 11 pt 37112 13 pt 37112 15 pt	37131 15	37131 48	37131 48
36411 00	36410 10	36410 20 36410 55 36410 63	36920 09	36920 09	36920 95	37112 05	37112 05	37112 11 pt 37112 13 pt	37131 16	37131 50	37131 50
			36941 01	36941 01	36941 11				37131 17	37131 52	37131 52
36412 00	36994 22	36994 11 36994 21	36941 02	36941 02	36941 16	37112 06	37112 06	37112 11 pt 37112 13 pt 37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37131 21	37131 37	37131 37
36489 12	36489 12	36489 11 pt 36489 19 pt	36941 03	36941 03	36941 31				37131 43	37131 30	37131 30
			36941 04	36941 04	36941 35				37131 49	37131 49	37131 12 pt 37131 25
36489 16	36489 16	36489 11 pt	36942 01	36942 01	36942 14 36942 28 pt				37131 53	37131 33	37131 33
36489 17	36489 17	36489 19 pt				37112 07	37112 07	37112 11 pt 37112 13 pt 37112 15 pt	37131 55	37131 34	37131 34
36520 00	36520 00	36521 00 36521 19	36942 02	36942 02	36942 28 pt						
			36942 03	36942 03	36942 27 36942 28 pt	37112 08	37112 08	37112 23 pt 37112 25 pt 37112 26 pt	37131 57	37131 54	37131 54
36520 01	36520 01	36521 01 pt 36521 02 pt							37131 61	37131 36	37131 36
			36942 04	36942 04	36942 37 36942 41 36942 42	37112 09	37112 09	37112 11 pt 37112 13 pt 37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37131 62	37131 38	37131 38
36520 03	36520 03	36521 01 pt 36521 02 pt							37131 63	37131 56	37131 56
			36943 01	36943 01	36943 11 36943 42 pt				37131 69	37131 69	37131 60 pt
36520 05	36520 05	36521 03 36521 04							37132 01	37132 79	37132 79
36520 07 36520 09	36520 07 36520 09	36521 05	36943 02	36943 02	36943 42 pt						
			36943 03	36943 03	36943 41 36943 42 pt	37112 31	37112 31	37112 11 pt 37112 13 pt 37112 15 pt	37132 02	37132 02	37132 71 37132 75
36520 11	36520 11	36521 12 36521 15							37132 03	37132 03	37132 98 pt
			36947 04 36947 05	36947 04 36947 05	36947 03	37112 32	37112 32	37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37132 05 37132 06 37132 07 37132 08 37132 09 37132 15 37132 16 37132 17 37132 18 37132 19 37132 21	37132 05 37132 06 37132 07 37132 08 37132 09 37132 15 37132 16 37132 17 37132 18 37132 19 37132 21	
36520 19	36520 19	36521 11 36521 13 36521 14 36521 16	36949 07	36949 07	36949 09 pt				37132 25	37132 77	37132 77
			36949 11	36949 11	36949 02						
36613 00	35732 50 36612 20	35732 00 pt 36612 00 pt	36949 12	36949 12	36949 03 36949 04	37112 33	37112 33	37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37132 26 37132 27 37132 28 37132 29 37132 31	37132 26 37132 27 37132 28 37132 29 37132 31	37132 98 pt
36614 00	36612 40	36612 00 pt	36949 13	36949 13	36949 05 36949 06						
36631 00	36621 00 36629 41	36621 00 36629 00 pt	36949 19	36949 19	36949 09 pt	37112 34	37112 34	37112 26 pt	37142 48	37142 48	37142 03 37142 04 37142 05 37142 22 37142 33 37142 37 37142 49
36632 00	36622 00	36622 00				37112 35	37112 35	37112 11 pt 37112 13 pt 37112 15 pt	37144 09	37144 09	37144 11 37144 13
36691 00	36624 00	36624 00	36991 00	36629 10 36629 45	36629 00 pt				37146 03	37146 03	37146 01 37146 02
36692 00	36626 00	36626 00				37112 36	37112 36	37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37146 49	37146 49	37146 19 37146 21 37146 39
36693 00	36628 00	36628 00	36992 00	36629 20	36629 00 pt				37147 07	37147 07	37147 03 37147 09
36714 00	36714 00	36711 00 36712 00	36995 00	36629 30	36629 00 pt				37148 03	37148 03	37148 04 37148 05
36715 00	36799 10	36799 00 pt	36997 00	35497 65 36629 47 36629 50	35497 65 36629 00 pt	37112 39	37112 39	37112 11 pt 37112 13 pt 37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37148 27	37148 27	37148 29 37148 31
36720 00	36797 00	36797 00							37149 20	37149 20	37149 21 37149 29 pt
36799 20	36799 20 36629 42	36629 00 pt 36799 00 pt	36998 01	36994 51	36994 51				37149 39	37149 39	37149 14 37149 15 37149 18 37149 19 37149 24 37149 26 37149 29 pt
			36998 02	36994 71	36994 71						
36799 30	36799 30	36799 00 pt	36998 03	36994 72	36994 96 pt	37113 01	37113 01	37113 13 pt 37113 15 pt			
36913 17	36913 17	36913 15 36913 16	36998 04	36994 82	36994 82						
			36998 05	36994 83	36994 83	37113 02	37113 02	37113 13 pt 37113 15 pt			
36914 25	36914 25	36914 21 36914 29	36998 06	36994 84	36994 84						
			36998 07	36994 85	36994 85	37113 03	37113 21	37113 21			
36915 01	36915 01	36915 72 36915 75				37131 01	37131 51	37131 51	37148 27	37148 27	37148 29 37148 31
36915 02	36915 02	36915 85	36998 19	36994 97	36994 81 36994 96 pt	37131 02	37131 02	37131 60 pt			
36920 01	36920 01	36920 10 pt 36920 70 pt 36920 82 pt	37112 01	37112 01	37112 11 pt 37112 13 pt 37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37131 03	37131 03	37131 12 pt 37131 44 pt			
36920 03	36920 03	36920 70 pt 36920 82 pt				37131 04	37131 04	37131 12 pt 37131 44 pt			
36920 04	36920 04	36920 70 pt 36920 82 pt				37131 06	37131 58	37131 58			
36920 05	36920 05	36920 10 pt 36920 70 pt	37112 02	37112 02	37112 23 pt 37112 25 pt						

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1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
3714A 01	3714A 01	37143 31	37322 21— Con.	37322 21— Con.	37322 40— Con. 37322 49	37433 03	37433 62	37433 62	38121 00	38111 00	38111 00
3714A 02	3714A 02	37143 21				37433 04	37433 69	37433 69	38122 00	36625 30 36629 44	36625 00 pt 36629 00 pt
3714A 03	3714A 03	37143 23	37322 23	37322 23	37322 47	37433 11	37433 71	37433 71	38210 10	38112 00	38112 00
3714A 04	3714A 04	37143 26	37322 25	37322 25	37322 48	37433 12 37433 13 37433 14 37433 15	37433 12 37433 13 37433 14 37433 15	37433 79	38210 20	38113 20	38113 00 pt
3714A 05 3714A 06	3714A 05 3714A 06	37143 49 pt	37322 27 37322 28	37322 27 37322 28	37322 55 pt				38244 00	38244 00	38244 11 38244 21 38244 31 38244 99
3714A 07	3714A 07	37143 44	37322 29	37322 29	37322 53 37322 55 pt 37322 61	37511 01	37511 11	37511 11	38260 00	38326 00	38326 00
3714A 08	3714A 08	37143 49 pt				37511 02	37511 21	37511 21			
3714A 09	3714A 09	37143 46	37323 03	37323 03	37323 11 pt 37323 30	37511 03	37511 31	37511 31	38271 00	38324 00	38324 00
3714A 10	3714A 10	37143 47	37323 05	37323 05	37323 11 pt 37323 35	37511 04	37511 42	37511 42	38272 00	38325 30	38325 00
3714A 11	3714A 11	37143 48				37511 05	37511 44	37511 44	38273 00	38325 40	38325 00
3714A 12 3714A 13 3714A 19	3714A 12 3714A 13 3714A 19	37143 49 pt	37323 07	37323 07	37323 11 pt 37323 50	37511 06	37511 51	37511 51	38295 10	38293 00	38293 00
37151 00	37151 00	37151 10 37151 50	37323 09	37323 09	37323 11 pt 37323 54	37511 09	37511 59	37511 59	38295 20	36625 20	36625 00 pt
									38296 00	38113 10	38113 00 pt
37152 01 37152 02	37152 01 37152 02	37152 00	37323 13	37323 13	37323 11 pt 37323 56	37511 10 37511 12 37511 13 37511 14 37511 15 37511 16 37511 19	37511 10 37511 12 37511 13 37511 14 37511 15 37511 16 37511 19	37511 71	38411 42	38411 42	38411 41 38411 45 38411 46
37211 00	37211 00	37211 21 37211 23 37211 28				37512 01	37512 01	37512 14 37512 17			38411 71 pt
37244 01 37244 02	37244 01 37244 02	37244 13	37323 15	37323 15	37323 11 pt 37323 58	37512 06 37512 07	37512 06 37512 07	37512 53	38411 72	38411 72	38411 71 pt
37244 05 37244 06	37244 05 37244 06	37244 53							38411 85	38411 85	38411 82 38411 83
37311 01	37311 01	37311 11 pt 37311 21	37323 17	37323 17	37323 11 pt 37323 70 37323 75	37512 01	37512 01	37512 14 37512 17	38411 87	38411 87	38411 84 pt
37311 02	37311 02	37311 11 pt 37311 31	37323 19	37323 19	37323 00 pt	37512 06 37512 07	37512 06 37512 07	37512 53	38411 97	38411 97	38411 98 pt
37311 03	37311 03	37311 11 pt 37311 41				37612 01	37612 25	37612 25	38411 99	38411 99	38411 98 pt
37311 04	37311 04	37311 11 pt 37311 51	37324 01	37324 01	37324 10 37324 15	37612 01	37612 25	37612 25	38411 99	38411 99	38411 71 pt 38411 84 pt 38411 98 pt
37311 05	37311 05	37311 11 pt 37311 61	37324 03	37324 03	37324 18 pt 37324 20 pt 37324 25 pt	37612 02	37612 02	37612 35 37612 45	38421 01	38421 01	38421 99 pt
37311 06	37311 06	37311 81 pt	37324 05	37324 05	37324 18 pt 37324 20 pt 37324 25 pt	37614 01	37614 13	37614 13	38421 02	38421 02	38421 35 pt
37311 07	37311 75	37311 75				37614 02	37614 02	37614 15 37614 17	38421 03	38421 03	38421 99 pt
37311 09	37311 09	37311 11 pt 37311 81 pt	37324 07	37324 07	37324 18 pt 37324 20 pt 37324 25 pt	37615 01	37615 11	37615 11	38421 04	38421 04	38421 11 pt
37313 21	37313 21	37313 98 pt	37324 09	37324 09	37324 18 pt 37324 20 pt 37324 25 pt	37615 02	37615 13	37615 13	38421 05	38421 41	38421 41
37313 29	37313 29	37313 10 37313 12 37313 14 37313 98 pt				37615 03	37615 03	37615 15 37615 23	38421 06	38421 38	38421 38
37316 01	37316 01	37316 13 37316 53	37327 01	37327 01	37327 22 37327 25 pt 37327 32 37327 35 pt	37922 61 37922 63 37922 69	37922 61 37922 63 37922 69	37922 59	38421 07	38421 71	38421 71
37316 02	37316 02	37316 19 37316 59	37327 03	37327 03	37327 25 pt 37327 28 pt 37327 35 pt 37327 38 pt	37950 01	37950 01	37950 11 37950 15	38421 08	38421 82	38421 82
37322 01	37322 01	37322 03 37322 04 37322 06 37322 08				37996 01	37996 30	37996 30	38421 09	38421 81	38421 81
37322 02	37322 02	37322 11	37327 05	37327 05	37327 28 pt 37327 38 pt	37996 02	37996 32	37996 32	38421 10	38421 45	38421 45
37322 05 37322 07	37322 05 37322 07	37322 19 pt	37327 07	37327 07	37327 28 pt 37327 38 pt	37996 03	37996 34	37996 34	38421 12 38421 13	38421 12 38421 13	38421 99 pt
37322 09	37322 09	37322 15				37996 04	37996 36	37996 36	38421 37	38421 37	38421 33 38421 34
37322 11	37322 11	37322 19 pt	37327 09	37327 09	37327 28 pt 37327 38 pt	37996 08 37996 09	37996 08 37996 09	37996 39	38421 91	38421 91	38421 99 pt
37322 13	37322 13	37322 17 37322 19 pt	37327 11 37327 13 37327 15	37327 11 37327 13 37327 15	37327 41	37999 01	37999 01	37994 92	38421 97	38421 97	38421 15 38421 99 pt
37322 21	37322 21	37322 40 37322 42 37322 44				37999 02	37999 02	37994 94	38421 98	38421 98	38421 11 pt 38421 35 pt 38421 99 pt
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			37328 00	37328 00	37328 11 37328 21	37999 04	37999 04	37998 64	38431 12 38431 13	38431 12 38431 13	38431 04
			37431 11	37431 72	37431 72	37999 05	37999 05	37998 80	38440 00	36933 00	36933 00
			37431 12 37431 15 37431 17 37431 18	37431 12 37431 15 37431 17 37431 18	37431 79	37999 06	37999 06	37998 53	38450 00	36933 00	36933 00
			37433 01	37433 41	37433 41	37999 19	37999 19	37998 35 37998 51 37998 82 37998 84 37998 86 37998 90	38511 18 38511 19	38511 18 38511 19	38511 17
						37999 21	37999 21	37998 88	38517 04 38517 05	38517 04 38517 05	38517 09

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38517 04— Con.	38517 04— Con.	38517 09— Con.	38731 06	38731 06	38737 01	39153 11	39153 11	39151 13 pt	39610 65— Con.	39610 65— Con.	39610 72— Con.
38517 06	38517 06		38731 07	38731 07	38737 02 38737 03	39153 12	39153 12	39151 31 pt	39610 71	39610 71	
38517 07	38517 07					39153 21	39153 21	39151 41	39610 93	39610 93	39610 91
38517 10	38517 10		38731 11	38731 11	38737 19	39153 31	39153 31	39151 51 pt	39610 95	39610 95	
38517 11	38517 11										
38611 11	38611 11	38611 12 38611 14	38731 13	38731 13	38736 39	39154 00	39154 11	39151 13 pt 39151 31 pt 39151 51 pt	39651 01	39630 11	39630 11
38611 69	38611 69	38611 67 38611 68	38732 01	38732 01	38732 10 38732 22	39314 24	39314 24	39314 23	39651 09	39630 15	39630 15
						39314 25	39314 25		39651 11	39630 41	39630 41
38611 91	38611 91	38611 81	38732 02	38732 02	38732 14 38732 24	39443 46	39443 46	39443 44 39443 45	39651 19	39630 51	39630 51
38611 98	38611 98	38611 43 38611 99	38732 03	38732 03	38732 16 38732 26	39443 47	39443 47	39443 99	39651 21	39630 61	39630 61
						39443 98	39443 98		39651 29	39630 98	39630 98
38613 17	38613 17	38613 27 38613 46	38732 09	38732 09	38732 18 38732 20 38732 29 38732 30	39447 16	36629 46	36629 00 pt	39654 22	39641 22	39641 22
38613 89	38613 89	38613 98				39493 01	39493 01	39494 62	39654 23	39641 23	39641 23
						39493 02	39493 02	39494 63	39654 31	39641 31	39641 31
38613 97	38613 97	38613 61	39113 11	39113 11	39112 11 pt	39495 05	39495 05	39495 99 pt	39654 33	39641 33	39641 33
38615 01	38615 01	38615 11 38615 17 38615 32 38615 37	39113 21	39113 21	39112 21 pt	39495 72	39495 72	39495 78 39495 79	39654 39	39641 39	39641 39
			39113 31	39113 31	39112 31 pt				39656 20	39642 20	39642 20
38615 02	38615 02	38615 63	39113 41	39113 41	39112 41 pt	39495 81	39495 81	39495 99 pt	39656 21	39642 21	39642 21
			39113 98	39113 98	39112 98 pt	39495 88	39495 88		39656 32	39642 32	39642 32
38615 03	38615 03	38615 73 38615 74	39114 11	39114 11	39112 11 pt	39495 92	39495 92	39495 90 pt	39656 33	39642 33	39642 33
						39495 93	39495 93	39495 91 pt	39656 51	39642 51	39642 51
38615 04	38615 04	38615 75	39114 21	39114 21	39112 21 pt	39495 96	39495 96	39495 90 pt 39495 91 pt	39656 71	39642 71	39642 71
38615 05	38615 05	38615 57 38615 64 38615 65 38615 76 38615 81	39114 31	39114 31	39112 31 pt	39495 98	39495 98	39495 99 pt	39656 81	39642 81	39642 81
			39114 41	39114 41	39112 41 pt	39496 01	39496 01	39494 65	39656 89	39642 89	39642 89
38619 00	38619 00	38619 41 38619 43 38619 45	39114 51	39114 51	39112 98	39496 02	39496 02	39494 68	39991 51	39991 51	39991 67
			39114 61	39114 61		39496 03	39496 03	39494 70	39991 61	39991 61	
			39114 71	39114 71		39496 04	39496 04		39991 69	39991 69	
38731 01	38731 01	38734 11 38734 12 38736 11	39141 41	39141 41	39141 66	39496 05	39496 05	39494 69	39993 00	39993 00	39993 36 39993 61
			39141 43	39141 43							
			39141 69	39141 69							
38731 02	38731 02	38734 22 pt 38736 13 pt	39142 35	39142 35	39142 34 39142 36	39496 06	39496 06	39494 70 pt	39997 11	39997 11	39997 00
									39997 51	39997 51	
38731 03	38731 03	38734 21 38734 22 pt 38736 12 38736 13 pt	39142 41	39142 41	39142 61	39523 00	39523 00	39521 00 39522 15	39998 13	39620 13	39620 13
			39142 43	39142 43					39998 15	39620 15	39620 15
			39142 55	39142 55	39142 54 39142 56	39524 13	39524 13	39522 13	39998 17	39620 17	39620 17
38731 05	38731 05	38736 31 38736 32 38736 33	39142 69	39142 69	39142 61 pt	39524 19	39524 19	39522 19	39998 21	39620 21	39620 21
						39610 65	39610 65	39610 72			

PUBLICATION PROGRAM

1987 CENSUS OF MANUFACTURES

Publications of the 1987 Census of Manufactures, containing preliminary and final data on manufacturing establishments in the United States, are described below. Publications order forms for the specific reports may be obtained from any Department of Commerce district office or from Data User Services Division, Customer Services (Publications), Bureau of the Census, Washington, DC 20233.

Preliminary Reports

Industry series—83 reports (MC87-I-20A(P) to -39D(P))

Preliminary industry data are issued in 83 separate reports covering 459 industries. Preliminary summary data for the U.S. and States are released in one report.

Final Reports

Industry series—83 reports (MC87-1-20A to -39D)

Each of the 83 reports provides information for a group of related industries ("dairy products" includes industries for butter, cheese, milk, etc.). Final figures for the United States are shown for each of the 459 manufacturing industries on quantity and value of products shipped and materials consumed, cost of fuels and electric energy, capital expenditures, assets, rents, inventories, employment, payroll, payroll supplements, hours worked, value added by manufacture, number of establishments, and number of companies. Comparative statistics for earlier years are provided where available.

For each industry, data on value of shipments, value added by manufacture, capital expenditures, employment, and payroll are shown by employment-size class of establishment, State, and degree of primary product specialization.

Geographic area series—51 reports (MC87-A-1 to -51)

A separate report is being published for each State and the District of Columbia. Each report presents data for industry groups and industries on value of shipments, cost of materials, value added by manufacture, employment, payroll, hours worked, new capital expenditures, and number of manufacturing establishments for the State, MSA's, counties, and selected places. Comparative statistics for earlier census years are shown for the State and large MSA's. Manufacturing totals are presented for each county and for places with significant manufacturing activity. Detailed statistics (including inventories, assets, rents, and energy costs) are presented only in statewide totals.

Subject series—7 reports (MC87-S-1 to -7)

Each of the seven reports contains detailed statistics for an individual subject, such as concentration ratios in manufacturing, type of organization, water use in manufacturing, textile machinery in place, distribution of sales by class of customer, manufacturers' shipments to the Federal Government, and a general national-level summary.

Reference series—1 report (MC87-R-1)

The Numerical List of Manufactured and Mineral Products includes a description of the principal products and services published in the 1987 Censuses of Manufactures and Mineral Industries.

Location of Manufacturing Plants—1 report (MC87-LM)

This report includes data for number of establishments by four-digit SIC industry and by employment-size class for counties, incorporated places of 2,500 inhabitants or more, and zip codes for each State. (This report is available only on magnetic tape and CD-ROM.)

Analytical Reports—3 reports (AR87-1 to -3)

Exports From Manufacturing Establishments (AR87-1)

This report presents data on exports by two- and three-digit SIC industry groups for the United States and States. Information is presented on value of direct report shipments and estimates of the employment required to manufacture these products. Included are estimates of employment in manufacturing and nonmanufacturing establishments that supply parts, materials, and services for production of manufactured exports.

Selected Characteristics of Manufacturing Establishments That Export (AR87-2)

This report presents data on the number of manufacturing companies and establishments that export by major group, State, employment size, and ratios of exports to shipments.

Indexes of Production (AR87-3)

The indexes presented in this report are designed to measure the change in physical output of each manufacturing and mineral industry between 1982 and 1987.

MICROFICHE

Every final published report in the 1987 Census of Manufactures will be available on microfiche.

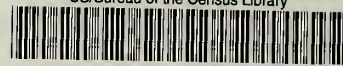
PUBLIC-USE COMPUTER TAPES AND COMPACT DISCS

Data from the final industry series, geographic area series, and the Location of Manufacturing Plants report will be available on public-use computer tapes and compact discs-read only memory (CD-ROM). These tapes will provide the same information found in the final reports. Computerized data products are available for users who wish to summarize, rearrange, or process large amounts of data. These products, with corresponding technical documentation, are sold by Data User Services Division, Customer Services (Tapes), Bureau of the Census, Washington, DC 20233.

OTHER ECONOMIC CENSUSES REPORTS

Data on retail trade, wholesale trade, service industries, construction industries, mineral industries, transportation, enterprise statistics, minority-owned businesses, and women-owned businesses also are available from the 1987 Economic Censuses. A separate series of reports covers the censuses of outlying areas—Puerto Rico, Virgin Islands of the United States, Guam, and the Northern Mariana Islands. Separate announcements describing these reports are available free of charge from Data User Services Division, Customer Services (Publications), Bureau of the Census, Washington, DC 20233.

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